FARMERS DIGEST

Volume 20 Number 5

35¢

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THE FARMER'S DIGEST

FORT ATKINSON, WIS.

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Published monthly, except June-July and August-September, when published bi-monthly at Fort Atkinson, Wisconsin, by Farmer's Digest Co.

1 Yr., $2.50, 2 Yrs., $4.50, 3 Yrs., $6.50
Canadian and Foreign Subscriptions, $3 for 1 Year, $5.50 for 2 Years, $8.00 for 3 Years

POSTMASTER: Return all undeliverable copies to Farmer's Digest, 97½ North Main St., Fort Atkinson, Wis. Entered as second-class matter at the Post Office at Ambler, Pa., July 30, 1948, re-entered at Fort Atkinson, Wis., under the act of March 3, 1879.

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The **Farmer's Digest**

Volume 20 **November 1956** **Number 5**

What Farmers Really Earn Today

Profits come harder. Farmers who stick with farming must reduce costs and improve management . . .

Condensed from Michigan Farm Economics

John Doneth

IT IS STILL possible to make a profit from farming—but it isn't easy. This is revealed by the results from 539 farmers who kept farm account books in cooperation with Michigan State University in 1955. These farms are 234 acres in size with 167 tillable acres. This is about twice the size of the average farm as reported in the 1954 census. These farms are operated in better-than-average manner.

Earnings Disappointing

It is no exaggeration to say that earnings on most farms were a disappointment in 1955. Labor income on these farm account farms averaged $993 per farmer (Table 1). This represents what the farmer has left for his labor and management

Table I. Average Income

Recent individual years	Labor income
1947	$3,486
1948	2,735
1949	1,815
1950	2,688
1951	3,782
1952	2,926
1953	2,447
1954	1,755
1955	933

Reprinted from Michigan Farm Economics, Cooperative Extension Division Michigan State College, East Lansing, Michigan

after all expenses, depreciation, family labor and interest on investment have been deducted from gross income. This is the lowest labor income figure in the last 15 years. It is also below the average figure for the last 27 years, the length of time the project has been going on.

Another comparison that shows the unfavorable financial situation on these farms is the percentage of record-keeping farmers who were "in the red" in 1955. Of the 539 farmers, 34 per cent were "in the red"; 17 per cent had labor incomes of $1 to $1,000; and 49 per cent had more than $1,000. The number of farmers "in the red" was the highest since the depression days.

Farm operators in 1956 are expected to realize a slightly larger net income than the figure for 1955. Higher prices in the second half of 1956 and payments of close to $300 million to farmers under the soil bank and wool programs will account for much of the gain.

How Have Farmers Stayed in Business?

If earnings are as unfavorable generally as shown here, then how have farmers stayed in business? Many, of course, haven't. Some have sold their farms. Others are renting out their farms or only working them on a part-time basis. The farmers who have stayed in business have made many adjustments.

The cash income and cash expenses on these farms have not changed drastically with the result that net cash income has shown only a slight decline. The net cash income per farmer in 1953 was $3,493; in 1954, $3,418; and in 1955, $3,332. The net cash figure has held up partially at the expense of inventories. Outlays for capital improvements were curtailed and less new machinery was bought. Prices for hogs and some crops were on the down trend. Farm inventories which showed a $694 increase in 1953, increased only $506 in 1954 and then actually decreased $6 in 1955. Farmers can only temporarily reduce inventories and still stay in business. In addition to inventory change, there was more family labor charge, more interest on investment, and slightly less net cash income. The combined result was a substantial drop in labor income.

Comparison of Different Sized Farms

During periods of favorable prices when the parity ratio is near 100 or above, many farmers increase net profits by stressing volume and giving less concern to costs. However, with a parity ratio of 80 as in 1955, ef-

ficiency of operation with more regard to costs was necessary to maintain net incomes.

The labor incomes on the different sized farm account farms for 1955 were not greatly different on the average (Table 2). The larger farms had a much larger volume of business, but the investments and costs were also much higher.

An important relationship, not shown by the information here, was that the range in earning figures was much greater on the large farms. Labor incomes on the large farms ranged from $14,000 "to the good" to $8,000 "in the red." The range on the small farms was from $5,000 "to the good" to $5,000 "in the red." Thus, in a price period like 1955, the opportunity to either make

TABLE II

Comparison of Different Sized Michigan Account Farms in 1955 (Excluding Fruit Farms)

	Small farms	Medium sized farms	Large farms
Total acres	132	201	346
Tillable acres	90	144	244
Number of men	1.3	1.5	2.0
Days of work per man	331	380	404
Gross income per man	$ 6,070	$ 6,903	$ 7,952
Gross income per acre	88	73	65
Investments (total book value)	$21,726	$30,072	$51,470
Machinery	5,112	7,087	10,451
Feed and crops	2,077	3,603	5,641
Livestock	3,538	4,617	7,501
Farm (less house)	10,999	16,765	27,877
Farm (present sale value)	$20,510	$29,951	$46,612
Gross income	$ 7,696	$10,250	$16,055
Total expenses	5,739	7,526	12,560
NET FARM INCOME	$ 1,957	$ 2,724	$ 3,495
Interest on investment	1,086	1,604	2,574
LABOR INCOME	$ 871	$ 1,120	$ 921

or lose money is greater on the large farm.

Regional and Type-of-Farming Differences

The decline in labor incomes did not occur in all regions of the state in 1955. The Saginaw Valley, dairy and cash crop area, showed an improvement in earnings over 1954 as did also the dairy farms in eastern Michigan and the Upper Peninsula. Good crop yields were the major factor that boosted returns in the Saginaw Valley. The two dairy areas had the lowest labor incomes in the state in 1954 and showed some increases in 1955 as the dairy situation improved a little.

The earnings figures for the last 27 years, 1929-55, show that the Saginaw Valley farmers are out in front with a labor income of $3,408 per farmer. The southern Michigan dairy and general livestock farmers are second with $2,748. The fruit farmers are third with an average labor income of $2,483.

Hog Prices Expected Higher Than Last Year

Last year's hog prices won't be repeated this winter, say agricultural economists at the University of Minnesota.

They expect hog prices to average 10-20 per cent higher for this fall and early winter than they did at the same time last year.

Farmers are expected to market about 10 per cent fewer hogs for the rest of this year than they did for the same period a year ago. The low hog prices in early 1956 were a result of unusually large number of hogs slaughtered at that time.

Hog prices should hit a normal seasonal low in November or December and strengthen after the end of the year, say the economists. By spring of 1957, hog prices should be about 20 per cent above prices for spring, 1956.

The 1956 spring pig crop was 8 per cent less than a year earlier and the fall pig crop this year is about 9 per cent less than in 1955. The economists expect a moderate decrease in 1957 spring farrowings.

Consumers are demanding more meat-type pork, resulting in more emphasis on topping hogs out for the market at 200-220 pounds, according to the economists.

With more early spring farrowings, the seasonal price peak is moving up from August-September to July-August. This has been a marked trend in the past three years. —*Minnesota Extension*

The Way to Whip Mastitis

Mastitis can be licked if you go about it the right way. Every dairyman will be interested in this discussion . . .

Condensed from Farm Journal

Ray Dankenbring and *Bob Fowler*

WE'VE about knocked out bovine tuberculosis, and we're rolling at last with a nationwide drive against brucellosis.

But except in three or four states, there's an alarming tendency to "live with" the most costly dairy disease of all: mastitis.

A special mastitis conference in Wisconsin last summer brought out these surprising facts:

◆ Dr. Joe Simon of the University of Wisconsin says it costs the average 20-cow dairyman in his state $25 a month.

◆ In 281 New York herds where all cows were tested, 51% had mastitis organisms in their udders, even though only 12% showed signs like ropey milk.

◆ In 60 California herds checked with the Whiteside test (white cell count) three out of 10 cows reacted, even though showing no mastitis.

◆ In 91 Connecticut herds where tests were made to find unknown infected udders, appropriate treatment and herd care boosted production 10%.

That just shows that a lot of cows being culled as "low producers" could stay in the herd, if the disease were detected. Mastitis can be a sneaker. *And it looks as if testing is the only sure way* to spot these cows and knock out the disease.

"We made no great progress in the fight against TB and Bang's until we began widespread testing," says Dr. H. G. Hodges of Cornell University. "The tests for mastitis may not be as simple, but they do the job."

So if we are really going to get down to brass tacks and show some real progress in beating mastitis, this may be the procedure:

1. Have your vet examine the cow and test her milk from each quarter to *see if she has mastitis.*

2. If necessary he'll send it to a laboratory to identify the

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

organism, or organisms, causing it.

3. When he gets the report back, he'll prescribe a drug that will knock out that particular germ.

4. Meanwhile, you bed, wash, milk and manage the herd to prevent re-infection.

What's so new and different about that? Well, if you're like most dairymen, you've heard plenty about using strip cups, treating with drugs and practicing good management. But you may not have heard about the first two steps—*testing for and identifying the bacteria.*

Scientists say there are as many as 22 different kinds of "bugs" that cause mastitis. How can you be sure what treatment to use if you don't know which one you're fighting?

Of course you have to test to find where and what the trouble is, then treat and retest maybe several times until the infection is cleared up. But more and more, it looks like the only way.

And proof is piling up that the increased production you get from cleaning up a mastitis-infected herd will quickly pay the cost of testing.

Some dairymen call in their local veterinarians who test the samples themselves or send 'em to a private lab. A few states are tackling the disease through field veterinarians and state-operated labs.

Connecticut, which has been one of the leaders, started in 1940 and now has about 1,150 herds in the program of *test, treat and manage right.*

A recent check of 328 DHIA herds on the program showed that average production went up about 10% in 91 herds that knocked out the most common type of mastitis—that caused by a bacteria called *Streptococcus agalactiae.*

Furthermore, Dr. H. H. Hale reports that at the end of 1955, 666 herds were free of *Streptococcus agalactiae,* 38 of those had been free for more than ten years and 291 for more than five years after they cleaned up.

A similar program is beating back mastitis in neighboring New York state, now in it's tenth year.

In one 265-cow herd — the *increased milk production in just one month* paid for more than $600 in veterinary fees and for overhauling the milking equipment to do a better job. New York dairymen use their local vets, who send the samples to one of six state labs.

Where there aren't state programs in operation, individual dairymen who've tried the idea swear it's the answer.

Take Allen Meyer, a young North Dakota dairyman. When he came back from World War II he bought some good Guern-

seys and thought he was set to go places in the dairy business, but he ran head on into mastitis trouble.

"*I tried everything*—and that means *everything* to the tune of $385 in one year. Still I had trouble."

In desperation he went to Fargo and dropped his problems on the desk of Glenn Holm, the college veterinary head, now Dean of Agriculture.

Dr. Holm laid it on the line: "Test to find the infected cows and what kind of organisms they harbor. Operate the best you know how—milk infected cows last, sterilize milkers between cows—follow all of the rules we know.

"Then treat for the organism that the tests show you are up against. If you treat without knowing the type of bacteria causing the trouble, you're wasting your money, wasting valuable drugs, and you may be hurting the cow."

Chopping fresh forage and hauling it to fattening cattle didn't pay in grazing and feeding tests at Michigan State University. Cattle on alfalfa-brome pasture gained 1.98 pounds per day compared to 1.52 pounds daily gains for steers fed the chopped forage.

Meyer followed Holm's advice, and his 20 cows changed from 53.3% negative to 100% in eight months !

It paid handsomely. It saved him from dumping more than $500 worth of milk a year, saved him from sending more cows to the packing house, and practically eliminated his drug bill. But most of all, his average herd production went up from 373 to 485.4 pounds of butterfat.

*Some Californian*s have found a middle ground between a statewide program and going it alone. The 100-herd Sacramento County DHIA started an individual cow testing program 15 months ago.

So far, they've discovered that three out of 10 cows were reactors, even though they didn't show mastitis signs. And they found few reactors in high-producing herds.

Drs. O. W. Schalm and A. C. Pier of the University of California based the Sacramento program on the Whiteside test which shows how many leukocytes or white blood cells are in the milk.

All milk has leukocytes, they point out—about 200,000 cc. in normal milk. But let infection get into a cow's udder, and Nature rushes leukocytes to the rescue. The count may run as high as 30 million per cc. in flakey, gargety milk.

Drs. Schalm and Pier use the

Whiteside test just to spot cows, and quarters, in trouble. If the leukocyte count is repeatedly above normal, they follow up with laboratory tests to find out which bug or bugs are causing it.

One old cow made a believer out of Art LaBarr, a Sacramento County dairyman. She'd been in his 40-cow Jersey herd for years and had never given trouble. Yet, one day LaBarr picked up his report; found her listed positive.

"I didn't believe it," he relates. "But two days later she showed it. Today, I'm testing on the vets' say-so rather than waiting for udders to go bad."

How much the local veterinarian costs, depends on the number of visits, treatments, and how bad the infection is. But generally speaking dairymen find that the testing and treatment pays for itself—*in a hurry.*

1. TEST to find which cows have mastitis. Tests vary from simple chemical color tests on the farm by vet to microscopic examinations in the lab.

2. IDENTIFY organisms causing trouble. Lab technicians may run more tests or even "cultures" where germs are grown on special foods for isolation.

3. TREAT according to the lab report. Your vet can recommend specific drugs to kill the bugs that showed up. That way there's no guesswork.

4. MANAGE to prevent reinfection. Test - and - treat cleans up herds. Keeping 'em clean, calls for clean yards, bedded stalls, good milking habits.

At Least Old Dobbin Made The Farmer Rest

Since the farmer traded his horse for a tractor, he has been able to get more work done in a day but he also has found himself menaced by "tractor fatigue." According to the American Medical association, farming now ranks third among major industries in the number of accidental deaths.

This, the AMA asserts, is largely because the farmer works the tractor longer hours than he did his horse and without the rest periods that a horse demanded. Old Dobbin would toil just so long and then take a rest which the farmer also had to take. Since the tractor has no horse sense and keeps going just as long as it has gasoline and oil, how is the farmer to be got out of the metal saddle?

Perhaps the only answer is to take the coffee break of metropolitan fame out to the rural areas and see that it becomes one of the mores. —*From the St. Louis Post-Dispatch*

The Soil Bank Approach

Comparing, evaluating and handling The Soil Bank . . .

Condensed from Farm Policy Forum

J. Carroll Bottum, Purdue University

THE UNITED STATES agricultural plant is now geared to produce 4 to 6 per cent more agricultural products than the current market will take at generally acceptable prices.

We have attempted to maintain more acceptable prices, without adjusting the aggregate supply, than would have prevailed in the free market during the last several years. The result has been large storage holdings by the USDA.

Suppose that through a soil bank program, 30 to 50 million acres of the present 300 million acres in harvested non-roughage crops can be shifted, into legumes, grasses and fallow. Then agricultural production and demand could be at least temporarily brought into balance at a more nearly acceptable price level.

The United States has a total land area of approximately 1,904 million acres. Of this, we have approximately 450 million acres in plowland. Approximately 150 million acres of this plowland is in hay and pasture crops and fallow. The remaining 300 million acres of plowland is in other crops. In addition to the plowland, approximately 965 million acres are permanently used for pasture and hay.

Our adjustment problem is to shift 35 to 50 million of the 300 million acres now in all other crops over into roughage and fallow.

Balancing Production and Demand

If our goal is to bring agricultural production and demand into better balance by shrinking agricultural output, it can be done in three ways: (1) by letting market prices shrink production, (2) through use of production controls across the board and (3) by shifting the excessive crop acres into grass by a soil bank program.

None of these are painless. Suppose the free *price* route is chosen. The several years of adjustment will be ones of low prices for farmers—even assuming full employment. Suppose we choose the production *control* approach. More rigid controls

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than we have yet experienced must be used to control total crop production. If the grass and soil bank route is taken, the payments must be large enough to attract the necessary acres.

Grass, legume and fallow crops are, to a certain extent, complementary to grain crops. Some increase in their acreage on many farms will increase the total quantity of grain produced on these farms in the long-run. Preliminary research studies at Purdue indicate that increasing these acreages of grasses and fallow by 10 per cent (about 15 million acres) from present levels would not reduce total production—if the roughages produced on the grass acreages were used by livestock.

Thus, no material adjustment would be expected from the first 15 million acres shifted into a soil bank if the grass land was pastured. And the adjustment would be slight if the soil-bank land were not pastured. This assumes the adjustment would be spread over the majority of the farms and not concentrated in one area.

We can expect new farming know-how will continue to be applied in agriculture — with or without a soil bank program.

Therefore, if agricultural production is reduced, additional acres of harvested crops will have to be shifted to grass and fallow. Perhaps 5 million acres will have to be shifted to the soil bank to equal the additions coming from new technology in an average year.

The lower-than-average producing acres of land will be shifted into the soil bank. Since there is always some slack in establishing bases and compliances, another 5 to 10 million acres may have to be shifted before realizing average reduction.

Results Will Appear Slowly

Thus, we might have a soil bank acreage of 25 to 30 million acres and still not see any noticeable effect on aggregate production. But a further shift of 10 to 15 million acres out of the non-roughage crops might provide a significant adjustment in total agricultural supplies.

That's why payments must be enough to attract the participation necessary to get adjustments of a 30 to 50 million acre magnitude—if a soil bank program is to be a significant factor in shrinking the supply of agricultural products. A program which brought about adjustments just short of these amounts might be pointed to as a failure, from the standpoint of adjusting total supplies. One which resulted in adjustments of this magnitude might be called a success. Of course, either program could be an income raising program by

providing a basis for payments to farmers.

How To Manage Payments

This brings us to the point that much less money will get the same shift in production *quantity* (not acres) in the marginal cotton and grain areas than in the high-producing corn, cotton and wheat areas. It costs more to get a farmer to shift 1 acre to grass in a 50-bushel corn area than to get a farmer to shift 2 acres to grass in a 25-bushel corn area. More opportunity exists at the extensive margin than at the intensive margin.

The soil bank payments may be made on the basis of:

1. the value of the alternative crop shifted to grass, such as is done under the 1956 act.
2. the value of the grass grown in the area; or
3. a land-rental basis which depends on the average value of crops grown in the area.

If the payment is made under the first basis the adjustments will be more uniform throughout the country. And they will be more uniform between the most productive and least productive areas. The amount of money required for a given shift in national production will also be highest under this plan. However, it will distribute the adjustments and the payments uniformly throughout the country. When payments are withdrawn, the land in the most productive areas will be that most quickly shifted back into corn, cotton and wheat. Therefore, from a standpoint of obtaining longtime adjustments in land use it will likely be least effective.

The second payment plan would give the greatest amount of adjustment in the marginal crop growing areas. Much more adjustment would be obtained with the same amount of money. It would be nearer in line with the conservation reserve program.

When payments are withdrawn or reduced, much of this land would probably stay in grass. Once the grass was re-established, it would be the best economic use for the land with peace-time prices. The land-use adjustments brought about would be most nearly in line with the kind of shift that would occur if free prices were allowed to bring about the adjustment. More of the money would tend to flow into the marginal grain areas and more adjustment would take place there. The high-producing corn, cotton, peanut and wheat areas would make some adjustment, but they would continue to grow more nearly their normal acreages.

Suppose the land-rental basis were used. The adjustment would tend to be more uniform throughout the country than under the second plan—but probably not

as uniform as under the first basis.

Under this plan some acreages would be taken out of all crops. But they would be taken most heavily from the lower-producing crops than from the higher-producing crops. A greater acreage shift would probably be required to get the same total change in supply, and payments would probably be as large as under plan No. 1. When payments were reduced or withdrawn, the land would tend to go back into crops.

Pasture Soil Bank Land?

There is another question in connection with the soil bank proposals. Should farmers be permitted to pasture the acreages put into the soil bank? Or should it limit pasturage as the present act does?

Studies in the Corn Belt indicate that if the grass is pastured, about 2/3 to 3/4 as much reduction can be obtained by pasturing the shifted land as by keeping it idle. Studies in the Great Plains area also show that about 2/3 as much reduction if acreages shifted from grain crops to grass crops were pastured.

If the grass in the soil bank were used, it would increase dairy and sheep production slightly. But the increase would come mostly in beef production. It would increase beef supplies, (perhaps by 10 per cent if the program was successful). But it would decrease total meat supplies.

Therefore, beef producers would benefit from the reduced supplies of competing pork and poultry products. Poultry and pork producers would lose some of their market to beef producers and beef prices would be at some disadvantage relative to pork and poultry prices. Larger acreages would have to be shifted if the grass was used and payments required to obtain the shift could be lower. These are some of the questions that must be recognized in determining whether to pasture the soil bank acres.

Advantages of Soil Bank

The soil bank approach leaves the balance of the agricultural economy free of controls except adjustment brought about by soil bank payments, which can be on a voluntary basis. Prices are allowed to go free. It avoids the complications in international trade that arise from production controls and high supported prices.

The soil bank approach moves the agricultural production pattern in the direction of soil conservation. It moves the food supply pattern in the direction of more beef per capita and less pork and chicken. It requires substantial payments out of the Federal Treasury. In total, it appears in

line with more of our accepted American goals than does the production control approach.

A soil bank program does not preclude programs for increasing the market for agricultural products. And in appraising the overall agricultural picture we should remember that we have an increasing demand for farm products at home of about 1½ per cent a year.

Woodlots Can Cut Farm Building Costs

Those trees on the "back forty" can save a farmer two-thirds of his farm building costs.

Parker Anderson, forestry specialist at the University of Minnesota, says that some 100,000 farmers in his state have woodlots big enough to supply all the poles and lumber necessary for many buildings.

He urges farmers to figure out their building and lumber requirements now, then plan to get as much of it as possible from the farm woodlot this winter.

You can have lumber sawed from logs for around $18 per thousand board feet. Add to that your own labor cost for cutting the logs and you still have lumber that won't cost more than a third as much as if you bought it, Anderson says. Lumber that you buy costs anywhere from $80 to $110 per thousand (or much more).

Any trees that grow in thick stands are useful, if you treat them with penta. All of the hardwoods—oak, maple, elm and ash—and most evergreens make good poles for pole-type buildings. Cottonwood, "popple," and other softwoods will furnish long-lasting boards.

With a sizeable woodlot, a farmer could build a pole-type barn, loafing shed, machine shed, corn crib or storage building with practically all home-grown material. About all he would need to buy would be roofing material.

In any case, poles need to be treated around the butts before they're put in the ground. Pressure treating with penta is best, says Anderson, but you can also get long life out of a pole by soaking it for 48 hours in a treating mixture.

For long poles, you can make a container for soaking 7 or 8 feet of the pole butt by welding two or more oil drums together.

—University Farm and Home News

How to Select the Right Crankcase Oil

New API standards make it easy to select oil. Multiple viscosity oils are fine for winter . . .

Condensed from Ohio Farmer

Melvin E. Long

DO YOU KNOW which oil to use in your tractor or car? You've probably heard such terms as API, HD, Detergent, DG, SAE 10-30, so often that you may be confused as to which is the best oil for your needs.

Here are some facts that should enable you to understand oil "terms," and help in choosing the best oil for your engines.

The most noticeable characteristic of oil is its "thickness," or viscosity. The SAE number for different "weight" oil is based upon this viscosity. The full official range of these numbers is 5W, 10W, 20W, 30, 40 and 50. This viscosity is determined by measuring the number of seconds required for a certain amount of oil to pour through a small hole.

Obviously, the hotter the oil, the faster it will run. The SAE numbers with the "W" attached means that these oils were measured at 0°F, and the numbers without the "W" mean that the oils were measured at 210°F. The "W" oils are better for cold weather operation, while the regular oils are better for hot weather use.

If you are going to use your tractor for heavy drawbar or belt work in cold weather, it would need a "W" oil for starting, but a regular oil would give better protection after the engine had warmed up.

The multiple viscosity oils, such as 5W20, or 10W30, are the answer under such conditions. They have the low temperature characteristics of 5W or 10W, yet they act like 20 or 30 oil at the higher temperatures. These are especially good in engines that are somewhat worn and would therefore have a tendency to be "oil burners" if you used an ordinary 5W or 10W oil.

These multiple viscosity oils may be used the year around, as they have the high temperature characteristics of the "heavier" oils. However, for summer operation a 5W20 has no advantage over a regular No. 20 oil and the regular oil is generally a few

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cents per gallon lower in price.

The SAE numbers are based upon viscosity alone. There are several other properties of oils by which they can be classified. A few years ago, such terms as regular, premium and supplemental and 2 were used to describe oils. In 1952, in an effort to provide some uniform system of describing oils, the American Petroleum Institute set up the following API standards:

For Service ML —

For spark ignition engines doing light and favorable service, such as light trucks, some tractors, and power units, and two-cycle engines burning oil-gasoline mixtures.

For Service MM —

For spark ignition engines that have trouble in controlling deposits or bearing corrosion when crankcase temperatures are high. Farm tractors, trucks, autos and engines on balers, combines and forage harvesters are in this group.

For Service MS —

For spark ignition engines having special lubrication requirements for controlling deposits or bearing corrosion because of operating conditions, fuel or engine design characteristics. Engines in this group include those in commercial or farm trucks making long trips or hauling heavy loads, and automobiles used for start-and-stop driving at low engine temperatures. Tractors doing winter chore work are included in this type service.

For Service DG —

For diesel engines with no severe requirements. Most farm wheel and crawler tractors, trenching machines and stationary engines for generators, irrigation pumps and feed mills will use this class of oil.

For Service DS —

For diesel engines with high operating temperatures or severe loading. Also used in engines using fuels or having design characteristics that tend to produce deposits or abnormal wear. Oils of this class should be used if the sulfur content of the fuel exceeds 0.4 per cent, or if the conditions of service are so severe that DG class oils will not serve adequately.

It is possible for a manufacturer to classify his oil as suitable for more than one service condition, for example, "for Service DG and MS." That means that in this particular case, the oil would be suitable for less severe service conditions in diesel engines, as well as the most severe conditions in gasoline engines.

The United States Bureau of Standards reported recently that tests of more than 150 engine oil "dopes" showed no important

improvement in engine performance.

Modern crankcase oils are chemically balanced and compounded to meet the requirements of a particular oil classification and are tested in standard engines. If in doubt about the serviceability of a certain oil, you should use an oil of the next higher classification. The addition of "dopes" to oil of the MM. MS, DG, and DS classifications may upset the chemical balance and do more harm than good.

The new "weigh-a-day-a-month" plan for keeping dairy herd records costs as low as 5 cents a cow per month, say dairy specialists.

In order for an oil to be fully described, it must have both an SAE viscosity number and an API service designation.

Probably the best rule of thumb to follow in oil selection would be to start with the viscosity and service designation recommended by the manufacturer in the operator's manual. Then, as the engine becomes worn, use a higher viscosity oil in the same or next higher service range.

It's generally a good rule to use as "light" an oil as is possible, without excessive oil consumption.

By choosing the correct SAE number, based upon weather temperature and the tightness of your engine, and the correct API rating based upon the type of use expected from your engine, you can choose the oil that will do the most efficient job of protecting your engine. Thereby, you can keep your repair expenses as low as possible.

"Aw, Aw!"

It was in late September in New England, and two motorists had stopped beside the road to eat lunch. The crows were especially noisy, prompting a discussion as to whether the "caws" which varied so in tone constituted a language. Over a stone wall a farmer was doing some planting, and they asked his opinion.

"Sure, they talk," said the farmer. "Just had a conversation with one."

"You mean to say you talk crow talk with them?"

"Nope. Crow spoke English. He flapped down onto a branch o' that elm over there and looked down at me and asked, 'Cawn?' I looked up at him and said, 'Nope, beans.' 'Aw,' he said, and off he flew." —*The Morton Messenger*

New Beef Building Blocks

Hexestrol, first cousin of stilbestrol, gives promise of still greater beef gains, according to research discoveries at the University of Missouri . . .

Condensed from Breeder's Gazette

HEXESTROL is the name of a newly discovered hormone. It is a first-cousin to stilbestrol — technically di-ethylstilbestrol. Hexestrol is di-hydrostilbestrol.

A 26% increase in gain and an 11% increase in feed efficiency was the result of a hexestrol cattle feeding experiment at the University of Missouri, according to Dr. A. J. Dyer. In addition to larger gains, the cattle receiving the hormone graded higher on foot, brought a higher price, shrank less in transit, and yielded a slightly higher dressing percentage.

The experiment involved 24 820-lb. long-yearling steers, divided into 3 lots of 8 steers each, carried over a 112-day feeding period. The control lot received daily a standard ration of ground ear corn, soybean oilmeal, and alfalfa hay. One experimental lot had 4 grams of rumen organisms per steer added to the standard ration, and the other experimental lot received the standard ration plus 10 milligrams of hexestrol daily.

Steers receiving hexestrol gained at a rate of 3.2 lbs. daily, the steers receiving the rumen organisms gained 2.7 lbs., and the control lot showed 2.54 lbs. daily gain at the end of the 112-day period. Hexestrol stimulated the appetite of the steers fed the hormone and they ate more grain than the control lot, but were still 11% better on feed efficiency than the control lot. The lot getting the rumen organisms required as much feed as did the control lot. However, during the first 2 weeks on feed, the steers receiving the rumen organisms did not scour and gained at a rate equal to that made by the steers fed hexestrol.

All three lots were marketed the same day and the hexestrol-fed steers brought $1 more per cwt. than did the control lot in addition to grading higher, shrinking less, and having higher dressing percentages. Steers that received the rumen addition to their ration brought 50 cents more per cwt. than did the con-

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trol lot and ranked second to the hexestrol-fed lot. The grader commented that the carcasses were tidy, having only a small amount of kidney fat and a minimum, but adequate, amount of exterior fat. However, the rib eye generally had only traces of marbling and tended to be soft. This was true for all three lots.

But Hexestrol for Stockers? No.

Adding hexestrol to a silage ration for stocker cattle had little or no effect upon the rate or economy of gain. Dr. Dyer explained the seeming contradiction by pointing out that growth-promoting hormones are of value in fattening rations of older, heavier cattle but seemed to have little value in maintenance rations of younger, lighter cattle. Hexestrol, like stilbestrol, seems to give greatest returns when added to an excellent fattening ration.

During the 85-day feeding test, 24 steers were divided into 6 lots of 4 each to test wheat, sudan and drouth corn silages with and without the hormone addition. Wheat silage was eaten in smaller amounts than either of the other two and produced an average daily gain of 1.1 lbs. when supplemented with 1 bu. of shelled corn per steer over 85 days. Drouth-corn silage was eaten in the largest amounts and produced an average daily gain of 1.4 lbs. with the addition of 3 bu. of shelled corn per steer. Sudan silage produced the poorest results although less of it was used when compared to corn silage; the daily gain was .95 lbs. when 3.7 bus. of corn per steer were added to the sudan silage.

From these results, it would appear that excellent wheat silage is superior to drouth-corn silage and it is slightly better than the sudan silage. The wheat had been ensiled when the grain was in the stiff dough stage. Grains were plump and tonnage heavy. Sudan was cut for silage toward maturity but many of the lower leaves had been stripped by grazing sheep. Drouth-corn silage was made from corn that would have yielded approximately 3 bus. an acre.

Rate-of-Gain is Inherited

Both commercial and purebred breeders are showing increasing interest in the rate-of-gain and feed efficiency of the bulls they buy. Birth weights, weaning weights, and conformation scores are other measures used in picking herd sires. Experiments have shown that rate and efficiency of gains are highly heritable characteristics; but, they are inherited *independently of* beef type and thickness of conformation. This makes it necessary to examine an animal's overall record when buying a herd sire, Prof. J. E. Comfort pointed out, and makes it neces-

sary to test bulls as to rate of gain and feed efficiency.

Prof. Comfort selected 7 Hereford bull calves from the University's beef cattle breeding experiment at Weldon Springs. They were picked because of their heavier weaning weights and better conformation scores. They were calved the first 3 months of 1955 and weighed 326 to 481 lbs. at 6 months of age. When they were brought to Columbia for the test, they were given a 6-weeks preliminary feeding to gentle them and to get them on full feed.

"Half of the trouble in life is caused not by what other people think, but what we think they're thinking."

—Waukesha Revolver

At the end of 140 days of full feeding, their daily gains ranged from 2.22 to 2.62 lbs. a day. While feed efficiency varied among the bulls, all of them did very well. The 7 bulls ranged in weight from 690 to 940 lbs. at the end of 140 days.

Then Prof. Comfort handled 3 lots of grade Shorthorn calves, 25 in all, to produce acceptable beef carcasses soon after weaning. These calves were weaned when 8 months old and were sold 2 to 4 months after weaning, depending upon the time it took to get them into good market condition.

Lot 1 was made up of Jan.-Feb. calves creep-fed while nursing. At the end of 8 months, they weighed 574 lbs. and had eaten 6.34 bus. of corn each. . . . Lot 2, also Jan.-Feb. calves, was fed grain the 6 weeks preceding weaning, when they weighed 530 lbs. They used 25 lbs. of grain apiece. Both lots were on wheat and lespedeza pasture during the grazing season. Since the first lot had received grain all the time they were nursing and the second lot for only 6 weeks, the difference of 37 lbs. between the two lots was small and points up the value of good pastures . . . Lot 3 was made up of calves born during March, April and May. They were also fed grain for a 6-week period before weaning and ate 2.46 bus. of corn each. They weighed 511 lbs. when weaned.

After weaning, each group was fed a ration made up of 8 parts shelled corn and 1 part soybean oilmeal by weight, with alfalfa hay for roughage. They were fed on this ration until they weighed 700 lbs. and had enough condition to grade Good to Choice. The first lot weighed 706 lbs. 70 days after they were weaned. The second lot weighed 764 lbs. 126 days after weaning. The third lot averaged 665 lbs. on March 10 and were marketed in April at 710 lbs.

Breeding by the Book

Showring fashions sometime run counter to commercial usefulness . . .

Condensed from The Agricultural Review

SOME FIFTY YEARS ago, following the rediscovery of Mendel's long-lost paper on inheritance in peas, Sir Daniel Hall ventured the prediction that the old art of stock-breeding would shortly be reduced to a matter of bookkeeping.

This, of course, has not yet come to pass. It is true that Mendel's work showed us how to breed the horns off our cattle and how to prevent the appearance of certain monstrosities and 'throw-backs'; told us why it should be impossible to 'fix' such characters as the attractive roan color in the Shorthorn; and improved our general understanding of the long-known effects of in-breeding, out-breeding and crossing.

But the qualities that really matter — the weight and quality of a sheep's fleece, the prolificacy of a sow and the food-conversion efficiency of her progeny, or the milk yield of a cow — each depends upon so vast a multitude of genes that it is impossible to disentangle their separate effects. Moreover, the expression of the individual animal's heredity is affected by the accidents of its life and by the environment in which it lives, so that it is still true, in respect of some qualities, that more than half the pedigree goes in by the mouth.

Nevertheless, book-keeping is playing an increasing role. Measurement of heritabilities has indicated those objectives which can still be most conveniently attained by following the old rule of breeding the best to the best and those for which we must resort to progeny-testing. Thus milk yield is so greatly dependent on feeding, cowmanship and the incidence of disease, that a progeny test of a bull is of much more value than his milking pedigree; but the compositional quality of milk is determined much more largely by heredity, and the case for pro-

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geny-testing would be less strong but for the fact that it can conveniently be carried out in combination with progeny-testing for yield.

In Britain, recording and progeny-testing are being successfully applied to dairy cattle, and a good beginning has been made in pig-recording and litter-testing. In the case of sheep, enough has been done to show that the progeny-testing of rams could pay good dividends. In the United States, promising results are being obtained from the progeny-testing of beef sires; moreover, the correlation between rate of liveweight increase and food-conversion efficiency is so high that valuable results could be expected without resort to individual rationing.

The time has surely come for the wider application of the progeny-test as a guide to the improvement of beef cattle and sheep. Moreover, since a large proportion of our beef and mutton is produced by cross-bred animals, and since different breeds 'nick' more or less happily, it would speed progress if we could have more, and more accurately controlled, tests of various possible crosses. If we want to mate our Friesian heifers with a color-marking beef bull should we choose the Hereford or the Angus? Is a Border Leicester the best ram to mate with Welsh Mountain ewes for the production of Welsh Half-bred lambs; and if the ewe lambs of the cross are in turn to be used for breeding what is the best choice of ram?

We might usefully breed increasingly 'by the book' if only the book contained more of the information that we need.

Recent research has served to emphasize the long-recognized fact that the rate of progress in livestock improvement depends on the number of qualities that we want to see combined in the perfect specimen. It is easier to breed for milk or for beef than for both — even if we assume that there is no incompatability between meaty conformation and efficient milk production. Similarly it is easier to breed for

In a village election in rock-ribbed Republican Vermont, one Democratic vote was discovered before the tabulation had been completed. Election officials stopped to ponder this marvel, then decided to complete the count. Another Democratic vote turned up.

"That settles it," said one official, "That dad-burned fool voted twice."

—Better Crops

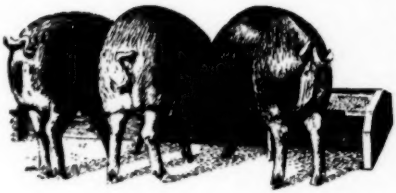
wool or for mutton than for both at once. The more complicated the objective that we set ourselves the slower will be our progress towards it.

Yet, first and last, a great deal of effort has been devoted to 'fancy' points . . . to qualities of not the slightest economic importance. In the early days of the breed, most Aberdeen-Angus cattle had more or less white markings on the underline; but today the pedigree breeder will not buy a bull, however good in other respects, that carries the very small amount of white that is now judged to be too much. A good Hereford must be deep red, but must have no dingy-colored hairs in its coat. A Shorthorn may not have a smutty nose. The best Border Leicester, judged as a sheep for the specific purpose of crossing with mountain ewes, will not pass muster unless he have a gaily-carried head, a markedly Roman nose and a 'good lug'. If he possesses these attributes a considerable deficiency in flesh or fleece will be forgiven. In other cases the mistake has been in exaggerating one particular useful quality at the expense of some other — for example concentrating on fleshing qualities to the extent of forgetting that it is a function of the dam to nourish its young.

Sometimes it has happened that show-yard fashion has actually run counter to commercial usefulness. For instance, the craze for fine bone, large flat feet and close action in the show Clydesdale, the wealth of 'feather' which was developed in the old Shire, or the minute teats of the old show Ayrshire cow were all obviously undesirable from the point of view of the practical man. In the Small White breed of pig, the 'propensity to make exceeding fat' was brought to such a pitch that not even the farm worker, lunching under a hedge on a winter's day could stomach the bacon which it produced. So the breed became extinct. Moreover, fashions have changed, and selection has had to be put into reverse.

All this does not mean that we should give up the attempt to assess the merit of an animal by hand and eye. Even in the case of the dairy cow there is some correlation between the score of points, as awarded by a competent judge, and milk yield; in the meat animal carcass quality can be assessed in the live animal, with considerable accuracy, by touch and sight. Fleece quality can be as well assessed on the live animal as on the wool-sorter's bench. But we cannot afford to neglect other means of assessing merit, and we should bear in mind such proverbs as 'a good horse was never a bad color'.

Hereditary Defects in Swine



Every hogman should be familiar with these defects and know how to guard against them when selecting breeding stock . . .

Condensed from The American Hampshire Herdsman

Stewart Fowler, Washington State College

THE SWINE producer who came through the spring farrowing season with a pig crop that is entirely free of evident defects may consider himself most fortunate. His task of selecting future breeding stock is greatly simplified.

Probably no breed of swine in existence today is entirely free of genes (hereditary units) for several of the various defects common to swine, such as hernia, cryptorchidism, and swirls. The frequency of such genes is greater in some breeds than others, but it is fairly safe to say that every breed is contaminated with hereditary material for one or more such defects.

The occurrence of structural defects in swine is ages old. Many of these defects impair normal reproduction in some way or result in a lowered economic value for the defective individuals. Thus, the desirability of eliminating such defects from the various breeds of swine is quite evident.

The present tendency is to regard most structural defects of newborn animals as heritable. Hereditary defects in animals are either anatomic or physiologic and are expressed as changes either in appearance or in functions of the parts involved. Similar defects due to abnormal development of the embryo also occur and may or may not be heritable. In order to determine whether a given defect is heritable, selective matings must be made, or family histories of defective animals must be studied.

The study of inherited defects is complicated by the fact that there are two distinct types—recessive and dominant. Although there is no visible difference between the appearance of the two in animals, there is a decided difference between them so far as their method of transmission is concerned.

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In general, animals showing recessive defects are the progeny of apparently normal parents, that is, individuals carrying the factor not only for the defect but also the factor or gene for the normal. Since the factor for the normal condition in such animals is dominant, it tends to mask-over or hide the presence of the factor for the recessive defect. Thus, recessive factors may be carried on and on for many generations before appearing in the pure or double combination, which is necessary before the defect is able to express itself in the appearance of the animal.

On the other hand, a dominant defect occurs whenever the factor is present in either single or double dose. This explains why the elimination of dominant defects by ordinary methods of selection is rapid and certain, whereas the elimination of recessive defects by the same method is slow and uncertain.

Although it is impossible to distinguish by inspection animals carrying damaging recessive factors from those that do not, inbreeding will identify such factors if they are present. Obviously, this is because inbreeding brings together like factors more often than does mating of nonrelated animals. Therefore, inbreeding may be used to isolate and eliminate many of the undesirable factors from the hereditary make-up of a breed.

Many research workers have reported the occurrance of structural defects, especially cryptorchidism and hernia, under various systems of inbreeding. Along with these two defects, such defects as inverted teats, cleft palate, closed anal opening, and swirls have been commanding the attention of research workers.

Cryptorchidism

Cryptorchidism is the condition which results from the failure of one or both testicles to descend into the scrotum. The condition appears to be more common among swine and horses than among cattle, sheep, and goats. This defect has been discriminated against by breeders and judges of purebred livestock for a long time, such discrimination being based on a widespread belief that there exists an association between cryptorchidism and sterility.

A testicle that is retained in the body does not produce viable spermatozoa as internal body temperatures are too high for their normal production. If one testis has descended into the scrotum, however, it is fully functional. Although the scrotal testicle functions freely, it is not desirable to save such boars as sires because of the constant peril of the transmission of the defect

to his offspring. In castrating such animals, it is often rather difficult to remove the retained testis. If the testis is not removed, the meat is not suitable for human consumption as the retained testicle will secrete the male hormone, which will give a pronounced sex odor to the meat from the carcass.

Investigators with the USDA secured data indicating that cryptorchidism in swine is a sex-limited recessive characteristic that in most cases can be accounted for by a one-factor explanation. This would mean that for a pig to express the condition, it would have to receive a recessive gene each from the sire and the dam.

Speed

Next to lightning, scientists have discovered the fastest moving thing is a nudist who has spilled hot coffee on his lap. —From Banks County (Ga.) Journal.

Hernia

Hernia or rupture, is the protrusion of part of the intestines or of any other internal organ through a natural or artificial opening of the body wall, without injury to the outside covering of skin. A hernia is named according to the part of the body in which it is located. The two kinds of hernias most commonly found in swine are umbilical and scrotal or inguinal. Umbilical hernia results from the failure of the umbilical ring to close during the development of the fetus. In scrotal hernia, the scrotum is enlarged as the result of loops of the intestines having descended into it by way of the inguinal ring through which the spermatic cord passes.

The Wisconsin Agricultural Station carried out studies indicating that scrotal hernia of swine is hereditary. A two-factor hypothesis, was advanced to account for the mode of inheritance. According to the hypothesis, herniated boars result from the double-recessive genotype. Sows of the same genotype are normal because of the different anatomy of this sex; however, they will transmit the recessive genes for the condition to their offspring.

A study of defects in swine at the Alabama Experiment Station included umbilical hernia. The evidence obtained seemed to justify the use of a two-factor hypothesis as an explanation for the occurrence and transmission of that type of hernia also. The expression of umbilical hernia seemed to depend upon a double-recessive genotype.

Eliminating Hereditary Defects

If such defects are to be reduced and eventually eliminated from our swine breeds, producers all over the country will have

to follow selection programs designed to that end. The following four rules can be used quite successfully by any producer that is interested in eliminating such undesirable genes from his herd:

a. Do not use either boars or sows that exhibit any objectionable defects.
b. Discard boars and sows that have produced progeny with such defects.
c. Do not save for breeding purposes any of the offspring of boars or sows that have transmitted these defects.
d. Discard all close relatives of animals having or transmitting these defects.

It goes without saying that such a program is strict, and it will result in the loss of many good genes in the process of purging the herd of bad genes. However, it can be depended upon to remove the undesirable genes from the herd.

Some modification of the above four rules is probably desirable for those producers with outstanding animals. For example, in common with the cattlemen attempting to eliminate dwarfism, the swine producer may establish a small "carrier" herd to test the animals referred to in rules "c" and "d". Also, occasionally a great breeding boar may come along that is found to be a carrier for cryptorchidism, hernia, or some other such defect. Rather than sacrifice the many desirable superior genes carried by the boar in following rule "b", I would use him on a limited number of top sows and progeny test his outstanding sons on "carrier" sows until I found an excellent non-carrier son to replace him. -Such modifications have real merit in the case of truly outstanding animals and should be applied with good common sense.

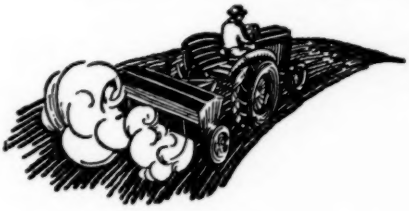
"FINISH IT"

When Henry Ford was making his first automobile in a little brick building at the rear of his home, he worked hard day and night, because he was very much interested in what he was trying to create. When he had finished it, his interest waned. He felt he had accomplished what he had set out to do.

But he began to think! He realized that if he quit now, and did not try to build a better car than his first one, his life would not amount to much. So he decided to start right away and make a better car.

When Henry Ford finally had a large factory, a young man once asked him, "How can I make my life a success?" Mr. Ford's simple answer was, "When you start a thing, finish it."

Fall Fertilizing Pays Big Dividends



You can take advantage of a price discount. The job of spreading is done on solid ground and the crop responds earlier in the spring.

Condensed from The Farmer
Thomas A. Doughty

WHETHER it goes on by bulk trucks, liquid or gas applicators, or by farm-owned spreaders, fall application of fertilizers is gaining in popularity. Yields of corn, grain, hay and other crops are turning out equally as well as with spring applications. On some farms yields have been even better, with little or no loss from leaching or run-off. Experiment station trials are showing the same thing.

Discounts up to 10%

One big factor in favor of fall purchased fertilizer is the price discount, which has ranged from 5 to 10%. Fertilizer industry people stress the discount as both a saving to the farmer and to them. Fall sales mean less storage and handling, thus greater output capacity at lower cost.

"The discount means quite a bit when you figure your investment is tied up until the following crop is harvested," says Roy

NINE REASONS FOR FALL FERTILIZING

- Price discount.
- Elimination of storage.
- Less handling and labor.
- Takes load off spring rush.
- Less trouble from soft fields and roads.
- Weather is more favorable.
- Legumes or fall-seeded crops get a growth boost before over-wintering, and get a quick start in spring.
- Stalks, stubble and trash decompose faster, especially with fall nitrogen application.
- Fall soil samples are easier to take, are returned in less time, and show accurate inventory of nutrients at end of crop season.

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Syverson, Redwood County, Minnesota. "Of course, there's no question but that the returns will be there. I feel the convenience of fall application far outweighs the investment tie-up factor." Last September, using his own spreader, Mr. Syverson applied 250 pounds per acre of 0-20-20 to barley stubble and southern alfalfa, plowed under as green manure for corn. Alfalfa for this year's hay was top-dressed with 300 pounds per acre of 0-20-20 or 250 pounds of 0-47-0, applied according to soil test recommendations.

"My fall fertilizer is paid for with the crop just harvested," says A. W. Raddatz, also of Redwood County. "This way, it's on the soil, paid for and out of the way. If I wait until spring, I may have to worry all summer about getting a crop to pay for it.

"Labor and storage saved by fall application amount to something too," he added. "In the past, when I've waited until spring to buy, it wasn't unusual to handle the fertilizer five times before it finally got on the field. If I bought 25 tons, that meant 125 tons of fertilizer to handle. Several times it was shipped in during a snow storm or muddy weather." Last fall, Mr. Raddatz had 300 pounds per acre of 6-24-12 spread by bulk trucks. It cost him 50 cents per acre for spreading on oats stubble and sweet clover plowed under for green manure. He followed this with 40 pounds of nitrogen per acre, sidedressed in the spring."

On the neighboring 640-acre Leonard Wittwer farm, each field in a three-year rotation of sugar beets, corn and soybeans gets a bulk application the fall of every third year, ahead of the sugar beets. He has 500 pounds of 0-30-15 per acre applied on the soybean stubble and plows it under that fall. Fifty pounds of nitrogen in liquid or anhydrous ammonia form go on the sugar beets as side-dress the following spring. He figures carryover of fertilizer from the sugar beets is enough to boost his corn and soybean crop.

"We need to fall plow here," said Mr. Wittwer. "If we wait until spring, we may run into trouble with the trucks cutting in and packing the fields. Besides, the fertilizer needs to be down where roots can use it."

C. M. Christensen, Brown County, has fall fertilized for corn the past two years. Last year, 25 acres of corn and 10 acres of alfalfa, both fall fertilized, outyielded spring-fertilized corn and hay by about 5 to 8 bushels and a ton of hay per acre respectively. Part of his second-year corn land got 300 pounds per acre of 5-20-20 plowed under in the fall. The rest got a similar treatment in the spring.

All the corn got an additional 60 pounds of nitrogen as side-dress. Alfalfa was top-dressed with 300 pounds per acre of 0-20-20.

Ferd H. Krenz, also of Brown County, agrees on the merits of fall application from the moisture standpoint.

"A year ago there just wasn't enough spring moisture in our area to make full use of the fertilizer," he said. This fall he'll apply phosphate and potash to a green manure plow-down crop. "The fertilizer may give the green manure crop a boost, and if it's plowed down this fall it will be ready to push the corn roots next spring. It should help push them deeper for moisture."

There are two kinds of fools. One says: "This is old, therefore, it is good." The other says: "This is new, therefore, it is better."

Stalk and trash decomposition is helped by fall fertilizer, especially nitrogen, says Elmer Webster, Nicollet County. He had 300 pounds per acre of 4-12-11 in liquid form custom sprayed on 35 acres of cornstalks. Cost of applying was 50 cents per acre. Steers had gleaned the field after picking, then the fertilizer applied. Stalks were disked once and plowed under in late October.

"The stalk ground worked up very good for corn again this year," said Mr. Webster. "Many of the stalks were well rotted and few of them came up attached to the roots."

Mr. Webster also applied 250 pounds per acre of 0-30-30 in dry form on a southern alfalfa green manure crop last year soon after the oats crop was off. His corn also got 125 pounds of 6-24-12 starter this spring, and the second-year corn got 60 pounds of anhydrous ammonia as a pre-plant application.

Still Uses Starter

"I'm still sticking with starter fertilizer, particularly on the low alkali spots," added Mr. Webster. "I figure the corn needs the push in the spring, especially if it's cold and wet. The plowed-under fertilizer carries from then on."

On the Roy Bach farm in Sibley County, anhydrous ammonia applications have been fall applied for corn. Two years ago, Mr. Bach put on 60 pounds per acre of the nitrogen on oats stubble plowed under in October. He covered the field with manure and followed with a starter of 125 pounds of 4-24-12 in the spring. His yield that year, with corn planted 4-5 kernels in 40-inch hills, was 135 bushels per acre.

Weed control is another point in favor of fall application, said

Art Rose of Sibley County. "They don't get off to such a quick start with the fertilizer plowed under."

He uses his own spreader to fall apply 200 pounds per acre of 0-30-30 on stalk ground and the same amount of top dressing for alfalfa. He follows with 80 pounds of nitrogen per acre as side-dress on second, third and fourth-year corn. He's aiming at five years of continuous corn under this system.

Corn Yield Up 95 Bushels

"In 1949, when I came on the farm, corn made 25 bushels per acre," he pointed out. "Last year, some of the second-year corn with the full fertilizer treatment went 120 bushels per acre."

Mr. Rose doesn't apply fertilizer to his oats nor does he use a starter on corn. He feels the heavier fall application gets pretty well distributed in the top six inches of soil after the first year or so, and the starter isn't needed. The carryover is enough to boost his oats crop, he adds. Soil tests show him whether or not he has enough fertility for 100-bushel corn — the mark he shoots for each year.

"One of the main objections to applying fertilizer previous to planting row crops, is the lack of placement control in relation to seed," points out Dr. J. M. MacGregor, University of Minnesota soils specialist. "However, the growing trend of fertilizing the soil rather than the immediate crop leaves little doubt of the value of fall fertilizing."

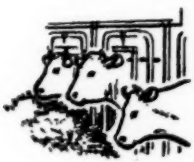
Several fall and spring fertilizer comparison trials have been carried on by University of Minnesota soils workers. In these tests, mostly on medium-textured soils, nitrogen, phosphate, and potash have been applied alone and in combinations on several crops.

A female housefly may deposit up to 2,500 eggs during a life span of two to four weeks. And when conditions are right, the eggs will hatch and the new generation reach adult stage in as little as eight days.

Results have shown that the fall applications are as effective as spring. Yields of the various crops were essentially the same, regardless of time of fertilizing.

The tests also have shown little or no apparent loss of nutrients from the fall-applied fertilizer once it was worked into the soil. However, Dr. MacGregor warns that this may not always be true in the case of coarse-textured sandy soils, especially where nitrogen is fall applied. Experimental work still underway will determine the capacity of the sandier soils to retain the fertilizer.

Plan for Cold Weather Silo Unloading



Special attachments and operating practices insure trouble-free handling of silage in cold weather by power unloader . . .

Condensed from Electricity On The Farm

Paul A. Edman

LAST winter the temperature in northern Minnesota dropped to a minus 32 degrees. It stayed below the zero mark for over a week. Would a silo unloader work satisfactorily when the silage was frozen? To get the answer, we decided to visit the Frank Parr farm, near Stephen, Minnesota and the Strickler Bros. farm near Euclid, Minnesota. The answer: an emphatic yes! However, special attachments, as well as operating practices, are used.

At the Strickler Bros. farms, an unloader is used in an 18 foot diameter silo, 50 feet high. The machine has been in service for 5 years. Each winter frozen silage has been handled satisfactorily. Often the silage has frozen in from a few inches to about 2 feet from the edges of the silo. A close check of the silage being 'thrown down' disclosed no evidence of any frozen silage, even though the silage was frozen several inches from the edge of the silo. It was finely cut and thoroughly mixed with unfrozen silage.

On the Frank Parr farm, we found a smaller machine. However, the electric motors used were the same size. Parr's corn silo is 14 feet in diameter. When we arrived the silo unloader was operated for about 10 minutes, to throw down enough silage to feed 56 head of beef cattle. An inspection of the silo showed freezing along the silo edges, but it was difficult to find any frozen material in the silage removed. A further inspection of the feed bunks showed no frozen silage there, indicating that the animals found all of the feed palatable. Commenting on the machine, Parr stated, "The silage was frozen in two feet from the edge last year, yet the unloader had no trouble handling it."

On both the Parr and Strickler farms we found the same operating procedure used. When the silage unloading operation was completed the operator raised the machine by use of the hand

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24 West 40th Street, New York City

winch located at the foot of the silo and allowed the motors to run for a few moments to clear the auger and blowers of any remaining silage. To begin the unloading operation, the motors were started and then the machine was lowered to the silage. Since the motors start under "no load" conditions, there is no trouble.

From what we found on our visits, it is safe to assume that a silo unloader will work in any of our northern states provided the machine is designed for use in frozen silage and the correct operating procedure described in this article is used.

Cattle Feeding Advice

Cattle feeders should exercise care in starting their cattle on full feed, in the opinion of T. W. Perry, Purdue University animal nutrition specialist.

Cattle that have just arrived on the farm should be fed average to poor quality hay and a mineral mixture in drylot for at least two weeks. Then they may, if they are to be grain-fed, be started on one pound of corn and one pound of protein concentrate per head daily, plus all the fair quality hay they care to consume. Cattle brought in directly from pastures on the farm should be started on the same program.

The second day, they may be fed two pounds of corn, two pounds protein supplement, and hay. If it is desired to get the cattle on full feed rather quickly, the corn can be increased by about one pound per head daily until the animals are consuming one pound of corn per 100 pounds of live weight. After this time, increases in corn will come more slowly, one pound of corn per day every three to six days until a "full feed" is approached.

Hand-fed cattle should clean up their grain and protein concentrate in 20 to 30 minutes. Longer than this shows their appetites to be a bit sluggish. As raises are made in the level of corn feeding, it may be necessary to cut back in the roughage feeding in order to encourage more corn consumption.

If the cattle are to be roughage-fed all winter, they may be started with a full feed of almost any dry roughage. Legume silage that has not been made with a preservative, should be fed with one pound of protein supplement or two to three pounds of grain, per head, daily. —*Farm News from Purdue*

Retail Poultry Farms Do Pay

Experience proves you succeed by building confidence in the products you sell . . .

Condensed from The Furrow

Charles Stratton

MAYNARD Tucker and his wife have been in the retail poultry business on their farm near Gloucester, Mass., for over 20 years. They started by selling eggs door-to-door. Just a few years ago, however, their business had increased to a point where one full-time deliveryman with a truck couldn't handle all the orders for eggs, fryers, roasting chickens, and turkeys. Another truck and driver were needed; but Tucker hit upon an idea. He decided to encourage his customers to pick up their own orders.

Discounts to Customers

Earlier, Tucker had figured the costs of delivering his poultry products: 3 cents per pound for poultry meat, 25 cents per turkey, and 5 cents per dozen eggs. Using these figures, Tucker gave his customers a similar discount if they would pick up their own poultry and egg orders. During the year before the discounts were made, about 100 customers came to the farm for their orders. The first year after the discounts were announced, nearly 300 customers picked up their orders. Last year, some 600 customers stopped at the farm to save some money. As a result, Tucker didn't buy the second delivery truck; in fact, he now hopes he can eliminate home deliveries altogether.

Tucker's retail poultry business has gone through many changes since it started. And, at each change, Tucker has had to convince some of his customers that the changes did not lower the high quality of his poultry products. At first, Tucker sold only freshly killed birds. Then, he discovered that many of his customers wanted their poultry dressed. For a while, he had to sell both freshly killed and dressed poultry, until all of his

Reprinted by permission from The Furrow, Moline, Illinois

customers were convinced that dressed poultry was really the most convenient.

Freezes Poultry

Another big change came when Tucker started to sell frozen poultry. Many customers weren't sure they'd like frozen birds. Now, nearly 100 per cent of the chickens and turkeys sold are frozen. Tucker won the confidence of his customers by guaranteeing every bird he sold and by selling only high-quality products.

The Tuckers try to keep 4,500 layers in production on their farm. Besides, they raise some 12,000 broilers and capons, and nearly 6,000 turkeys yearly. Tucker buys his turkey poults from Raymond Reed of Andover, Mass., in batches of 1,000, starting in January and continuing through to July. The poults are started in a centrally heated brooder house. Early flocks go onto porches in April. At 24 weeks old, or at 20 to 22 pounds, the turkeys are dressed and frozen.

As soon as the last turkey flock is off the porches in December, Tucker lays tarpaper on the floor, adds 4 to 6 inches of litter and encloses the sides with Celloglass. He then starts either replacement pullets or broilers—or whatever birds he needs until the space is to be used for turkeys again in April.

Farmers Fertilize Heavily

A near-record use of commercial fertilizer for all purposes in the United States has been reported by the National Plant Food Council. An all-time record tonnage of fertilizer used was reached in 1954, but last year the actual amount of plant food used showed an increase. This is explained by the fact that farmers, gardeners and other users are getting more actual plant food—nitrogen, phosphorus and potash—per ton. Just for the record, the total fertilizer used last year amounted to 20,416,410 tons.

What'd He Miss?

It was the new hired man's first day on the job. He came out to the barn at 6:30 rubbing the sleep out of his eyes.

"You should have been out here at 5:30," roared the farmer.

The hired man got his eyelids opened enough to squint at the farmer and asked, "Why, what happened?"

—Curtis B. Gaylord in Ford Farming.

Which Forage Plan For You?

Here, in capsule form, are the facts on different methods of forage utilization. No one method is best for all farmers. Weigh the advantages and disadvantages of each, and then determine which system, or systems, of summer feeding best fits your farm . . .

Condensed from Successful Farming

Feeding Out of Storage

Advantages

1. Highest quality forage: Almost complete control of quality. Forage can be cut at optimum stage of growth.

2. Less labor per man. If mechanized, less labor is needed than with green feeding or rotational grazing. Heavy demand for labor at harvest time—slacks off once forage is in storage. Works well if forages are long way from barn.

3. Controlled feeding: Again, you have almost complete control of amount and quality of forage fed. Production stays at an even level. Cattle are close to water and shade.

4. Efficient use of storage: Hay and silage storage kept busy entire year. Make 1st cutting into silage for summer feeding. Then fill silos with corn silage in fall. Make hay or silage of 2nd or 3rd cutting.

5. Complete bloat control: You completely eliminate danger of bloat by feeding out of storage. Cattle are confined to small area —you can keep a close check for trouble.

Disadvantages

1. Labor involved: Requires more labor than straight pasture —about same as green feeding or rotational grazing (depends on how mechanized each method is).

2. More storage space necessary: You need facilities for handling 8 to 12 months' supply of forage. This varies, depending on how often you fill and empty storage space.

3. Manure problem: You have more of a manure and fly problem than when cattle are on pasture.

4. Investment costs: Cost of this system depends on what you start with. You can get by with standard hay- and silage-making equipment. Extra cost comes if storage is needed and if feeding

Reprinted by permission from Successful Farming, Des Moines, Iowa

system is mechanized.

Green-lot Feeding

Advantages

1. Most efficient use of forages: Green-feeding forages in right stage of growth gives more production per acre than any other method. Reasons: You feed entire plant; no loss from trampling; no loss from fermentation.

2. Better control of bloat: Farmers report little or no bloat trouble—much less than with rotational or straight grazing. Cattle are closer to buildings—easier to watch.

3. Levels out production: You can maintain both the quantity and quality of forages all through the summer months. By controlling dates of planting and using different crops, you can use each crop at about its best stage of growth. Green feeding makes best use of rank-growing crops such as sudan and corn.

4. No fencing required: One of the big advantages of green feeding.

Disadvantages

1. Daily job: There's no getting around the fact that once or twice a day you must go to the field and chop forage.

2. Added machinery needs: Essential in a green-lot feeding program is a forage chopper. A direct cut is preferred. With machinery you can expect breakdowns. A stand-by pasture is a good idea in case of a major breakdown. A self-unloading or self-feeding wagon keeps labor low.

3. Difficulty in regulating growth: In the early summer you have too much forage, and in the late summer quite often a lack of forage. Excess forage can be made into hay or silage. Plan on filling late-summer forage needs with sudan or corn.

4. Manure handling: As with feeding out of storage, you have a manure problem.

Continuous Pasture

Advantages

1. Less labor: This system requires the least amount of labor. One thing offsets part of advantage—rounding up cattle.

2. Manure on land: You don't have much of a manure problem when cattle are on straight pasture. One or two scatterings a summer might be necessary.

3. Least management needed: This could be a factor in your decision if your time is at a premium. A beef cow herd would be a more logical choice for straight pasture than a dairy herd. Reason: The dairy animals are normally handled more than beef animals. Beef cattle on feed fit either system of forage utilization.

4. Best for rough land: On most farms, there are several acres of rough or timber land. This, of course, is best utilized by straight grazing. Young dairy

stock or beef brood cows are best on this land.

Disadvantages

1. Wastage and trampling: Trampling is a problem, especially with rank, fast-growing crops. Cattle have a tendency to nip off the tender part and the stem soon gets tough. Some forage is also lost due to contamination with manure.

2. Fencing cost: A good fence is required with any type of continuous grazing.

3. Bloat problem: Probably the most serious objection to this system when legumes are included in the mixture. It doesn't take many losses from bloat to take the profit out of this method of forage utilization.

4. Least return per acre: This is a combination of a number of factors: Trampling, loss from manure, bloat losses, and uneven quality and quantity of forage.

Rotational Grazing

Advantages

1. More feed per acre. By controlling the amount of forage available, there is a more efficient use of forage than with straight pasture. Animals consume more of the entire plant—less forage is lost by trampling.

2. Right stage of growth: Again, as with green feeding, you can control the stage of growth once the pasture rotation is set up. Excess forage can be made into hay or silage.

3. Manure on land: Manure is deposited directly on land. It may be necessary to scatter after each grazing of an area.

4. Controlled production, consumption: Since you regulate the amount of forage available, you can control consumption to give you the highest production per acre from grazing. With rotational grazing, green feeding, and feeding out of storage, you substitute time and management for increased production per acre. This is especially important where acres are limited.

Disadvantages

1. Labor in moving fences: If you're on a daily rotational program, you must move the fence at least once a day—possibly twice. This chore comes at a busy time. But again, many farmers feel it doesn't take any longer to move the fence than it does to round up the cattle when grazing open pasture.

2. Cost of fencing: Area-type grazing (fencing off 5 acres or so) means additional fencing cost and maintenance. A single-wire electric fence is best with daily rotational grazing—cuts down on extra fencing costs.

3. Bloat problem: You still have the bloat problem with rotational grazing. Many farmers feel that this system helps cut down on the number of cases

over straight grazing.

4. Trampling: Rotational grazing works both ways in regard to trampling. With heavy forages, such as sudan, you may actually get more trampling than with straight pasture. With average growth you can carry more cattle per acre since the cattle eat more of the entire plant.

5. Water problem: If pasture is fenced off in small plots, you need a handy water supply for each plot. Otherwise, the cattle will have to travel too far to get a drink.

Farm Storage of Corn Paid Seven Years Out of Past Eleven

With present prospects of a big corn crop, Willard T. McAllister, farm management specialist at the University of Delaware, points out that farmers won't be able to make full use of the federal government's price support program on corn unless they have well-constructed storages available to hold the corn in good condition. County committees, of farmers who administer the price support program have to require certain minimum standards in determining whether storage facilities on a farm are good enough to prevent the corn from getting moldy and dirty, he says.

Even disregarding the government price support program, it has proved a paying gamble to farmers for 7 years out of the past 11 to hold their corn in storage after harvest and not flood the market with it all at once, McAllister points out. In only 4 years since 1941 has the price of corn failed to rise sufficiently between October harvest time and the following July to make storage worth the cost.

McAllister also reminds farmers that they can get government-guaranteed loans at only 4% interest to build grain storages. He reports that up to 80% of the total construction cost of the storage can be financed this way. Furthermore, the federal income tax laws permit grain storages to be written off tax-wise in only 5 years instead of the 15 to 20 year depreciation usually required for farm structures.

Farmers can learn full details of requirements for storing grain under the government support program and also minimum standards needed for storage structures by contacting their county ASC committee, McAllister said. He also noted that the county agricultural agents would be glad to help with building plans and ideas for corn storages. —*University of Delaware*

Fitting Sheep Into Your Farming

Recommended: 40 or 80 ewes, a first-rate ram and sheep "know-how". Second article of a series . . .

Condensed from
Wisconsin Bulletin 470

SHEEP ARE suited to many farms where the land is well drained, where acreage can supply the pasture needed, and where the farmer wants to diversify operations.

The two crops, lambs and wool, add extra dollars to income and assure more efficient returns on feed and labor. Lambs are the only animals that can be sold off pasture at top price. Wool is always in demand and has never yet been overproduced in America.

Sheep and Dairy Rations Are Much Alike

Adding a flock of sheep does not mean extensive change in cropping practice. Sheep make very efficient use of roughage crops and may be fed the simple home-grown rations used for milk production.

First Costs Can Be Reasonable

A start in sheep raising may be made on a small investment. Flocks of 40 or 80 breeding ewes make profitable units.

Expensive Sheds and Barns Are Neither Necessary Nor Advisable

Often buildings on hand will provide the dry, clean quarters sheep need. As long as dry bedding and shelter from storms is furnished, cold offers no great problem. Equipment needed—feeding racks, salt boxes, troughs, may be built of inexpensive home sawed lumber.

Lambs Consume Pasture Otherwise Wasted

At weaning time, lambs can be turned onto second-cutting hay fields, grain stubble and corn fields where they clean up the lower leaves of the cornstalks, eat the weeds between the rows and the grass along the fence rows.

Labor Requirements Are Low

Periodic checking of a flock is necessary, even on pasture. But it is estimated that only 5-7 *hours*

Reprinted from Wisconsin Bulletin 470, More Profit From Farm Sheep, published April 1956 by University of Wisconsin Extension Service, Madison, Wis.

of labor per year are required for each ewe.

Finally, Sheep Have A Place

Sheep have a place on many farms where high income is combined with a far-sighted program for conserving soil and maintaining its fertility.

Two Kinds of Sheep Raising

The "farm flock" is the most popular form of sheep-raising in Wisconsin. Cash returns come from (1) *the sale of wool* shorn from older sheep in the spring and (2) *the sale of lambs* in summer or fall.

Two different methods of handling the flock have developed. The sheep-raiser should choose whichever best suits his own farm condiitons.

Method 1.

Saving about one-half of the ewe lambs each year for flock replacements. The average age of breeding ewes is usually about 4 years. To keep the flock the same size, it is necessary to replace each ewe every 4 years. This means saving about one-fourth of a 100% lamb crop (one-half of the ewe lambs) each year. Native or Western ewes may be used for foundation stock.

This method has some distinct advantages. The sheep raiser can improve his flock through better breeding. Wise selection for quality and productivity will result in a higher net income per ewe, provided good management follows.

Method 2.

Buying replacement ewes. Most sheepmen who manage flocks this way find it more satisfactory to purchase yearling or aged Western ewes through a livestock agency.

Usually an entire ewe flock is bought at one time, a purebred mutton-type ram is used, and all lambs are sold each season. After four or five years, the entire flock is sold and replaced with a new flock of young Western ewes.

Such a plan plainly offers no chance for improvement in type of animal nor fleece weight. About all the sheep-raiser can do toward flock improvement when he buys replacements, is to insist on large, deep-bodied, smooth ewes, all as sound and uniform as possible.

A vigorous, rugged ram with a deep, thickset body is of prime importance. Experiments have shown that a good purebred ram will add 7 to 8 pounds to each lamb at market time compared to a scrub ram. Consequently, the purebred ram that is worth $75 may be cheaper in the long run than an inferior ram. Remember the ram sires *all* the lambs in most flocks, whereas the ewe mother is re-

sponsible only for one or two.

A good purebred ram will normally cost four times the price of commercial ewes, but his performance can well justify his cost.

Handling "Feeder" Lambs

In lamb feeding, Western "feeder" lambs are bought in late summer or fall and fattened on corn fields or pasture and grain. Such lambs are usually bought through livestock agents and shipped in double-deck cars, each deck loaded with about 100 lambs weighing from 60 to 75 pounds each.

As a rule, Western feeder lambs are fed from 60 to 90 days, or to a weight of 90 to 110 pounds. Each lamb should gain about one-third of a pound daily. About 8 to 10 pounds of hay and grain is required for each pound of gain.

Shelter for feeder lambs is advisable but not absolutely necessary. About 5 square feet of floor space per lamb is usually enough. When lambs are fed in a lot, 16 to 20 square feet per lamb should be allowed. One linear foot of hay-and-grain trough space per lamb is advisable. However, if lambs are self fed, trough space may be reduced; in this case, 10 linear feet will accommodate 20 lambs.

In Wisconsin, lots of feeder lambs range from about one hundred to several thousand. Some death loss usually occurs during shipping or on feed. This should not exceed 3% if the lambs are started on feed slowly, if they are not over-crowded and if general good management is practiced.

Here are the steps to follow during the first three weeks after feeder lambs are received:

1. *Allow lambs to rest* a few days—to recover from strain of travel and shipping.
2. *Start grain-feeding slowly.* Don't feed full grain ration at start; step up little by little.
3. *Shear.*
4. *Drench* with lead arsenate or diphenthane for tapeworms.
5. *Dust* with rotenone.
6. *Drench* with phenothiazine for stomach worms.
7. *Vaccinate* against "overeating" disease (Enterotexemia).

These same management steps apply to handling thin native lambs in the fall.

TWO CROPS:

Lambs and Wool

In Wisconsin about three-fourths of the income from sheep is from meat and one-fourth from wool. Studies show that income from lambs depends largely on the following:

1. Raising more of the lambs born.

Approximately one-fourth of the lambs born never reach market. The sheepman's greatest loss is dead lambs. Proper care at

lambing time, feeding the right rations and keeping down parasites helps to reduce the number of lambs lost at birth or before market.

2. Fattening lambs properly.

The well fattened lamb not only weighs more but yields higher-quality, firmer meat, and a more uniform carcass.

Remember too that lambs should grade choice to prime when marketed. If they are thin, they will be resold as "feeders." Carcasses without finish have no consumer appeal.

Lambs may not fatten properly for these reasons: (1) they have not been creep-fed (2) their mothers have been too poorly fed to milk well and (3) parasites, gotten from the ewes or from egg-infested pastures, have retarded thrifty growth. The obvious answer is to give pregnant ewes enough well-balanced feed, to creep-feed lambs to give them a good start and to keep down parasite infections.

3. Marketing at proper time.

Wisconsin lambs should be marketed by September 1. This way lambs will not compete with Western or other midwestern lambs offered for sale when grass is gone. Currently only 16% of Wisconsin lambs are sold by September 1.

4. Top grade means top price.

Lambs are sold on the market on the basis of grade. The five grades in the order of their value are: *prime, choice, good, utility and cull.* The grade of the lamb is determined almost completely by its fatness or finish. Some lambs will grade prime if they have been on good pasture. Others will need grain to reach top grade. Pressure of the fingers on the back is an easy way to judge finish. It is desirable to have lambs "finished out" between 90 and 100 pounds.

5. Bringing lambs to market in good condition.

Fleeces that are wet or dirty, or spattered with mud and manure, look uninviting. "Tagging" lambs when marketed makes a good impression on buyers. "Tagging" means trimming around the dock to remove straggly, dirtied ends of fleece that don't count in weighing and detract from neat appearance.

What's Wanted in Wool?

Wool is one of the most valuable farm products but it is easily spoiled. Therefore it pays to use care during shearing to prevent spoilage, as well as at all other times. Allowing sheep to pick up foreign material in fleeces throughout the season is expensive. Dirt, chaff, burs, hayseed and straw in wool cost money. These must be removed be-

fore wool is used for spinning; removal makes processing costly. The best plan is to prevent spoilage while the fleece is on the back.

Wool is ordinarily sold on grade. Quality affects price. However, grade and quality do not mean the same. Grade refers to *fineness* of fiber in single fleeces, and to the *length* and *staple* of such fleeces. Quality refers to the freedom from foreign material and to the "life" or "character" of the wool itself.

Government Grading

U. S. government grading for wool is the standard in the wool trade. For convenience, six grades have been established: fine; half-blood; three-eighths blood; quarter-blood; low quarter-blood; and braid. In the beginning, these terms referred to the percentage of fine wool breeding in the animals that produced the fleeces. At present, they designate a certain degree of fineness of fibre and length of staple.

Within grades, wools are classified on the basis of *length*. "Combing" wools have longer fiber and higher spinning quality. "Clothing" wools have shorter fiber and less spinning value. For example, "Three-eighths combing" indicates wool of three-eighths degree of fineness and longer fiber. "Three-eighths clothing" indicates three-eighths grade degree of fineness but short fiber. Poor shearing can affect length. "Second cutting" commonly follows a hasty or poor shearing job. Fiber length naturally suffers.

These terms are commonly used and should be understood by those who sell fleece on a grade basis.

What Makes Rejects?

These are found in all breeds and are generally due to improper management. Some of the common causes of "rejects" are: *"Gray" or off-color fleeces:* due to rams or ewes of black-faced breeds carrying "black fibers" throughout their fleece. *"Burry" wool:* burs in fleece from pasture. *"Seedy" wool:* hay or feed particles in fleece resulting from careless handling over backs of sheep in winter. *"Cotted" or short, felty fleeces:* from old ewes low in vitality, or from animals that have been poorly fed or heavily infested with ticks. Such fleeces are practically worthless for spinning. *"Dead"* wool

Less than half the nitrogen fertilizer added to cultivated soils in humid areas of the country is usually recovered in the crop, according to soils specialists. Researchers say the low recovery is due mainly to erosion, leaching, and gaseous scattering of nitrogen.

from sheep shorn after death. *"Pulled"* wool: from fleeces taken from slaughter sheep and lambs at packing plants. *"Spoiled" wool:* due to tying wool too tightly, or shearing when wet. Hence, a wool box is not recommended.

National Wool Act 1954

Sheep numbers and domestic wool production are presently the lowest since Civil War years. Nearly 3 out of every 4 lbs. of wool consumed in America is foreign wool. This new program, of at least 4 years duration, is to encourage an increase in sheep numbers in the interest of national security and the general economic welfare.

The Secretary of Agriculture will set the average price of wool at not higher than 110% of parity in advance of each wool marketing year. This is to be called an "incentive" price. If the average price of all wool sold during the year falls below the incentive price, then an incentive payment of the difference will be made. The funds will come from the tariff revenue on imported wool.

It must be remembered that the difference between the actual selling price and the incentive price will include an average of all wool in the U. S. and a standard percentage difference will be determined. This one percentage difference will be applied to the return of all producers. This is to encourage quality production and efficient marketing. See your Country A.S.C. office for more complete information.

A man may fail many times but he isn't a failure until he begins to blame somebody else.

(To be continued next issue.)

Easy Fence-Post Treatment

A relatively simple chemical treatment which promises to extend considerably the life of soft and hardwood fence posts has been developed. The new treatment calls for standing green posts first in a water solution of copper sulfate and then in a water solution of sodium chromate. By so doing the two chemicals diffuse into the post and combine to form copper chromate, the results of which are toxic to fungi and insects, practically insoluble in water, and will not leach from wood placed in damp soil.

How To Use Your Farm Checking Account

Your bank deposits and cancelled checks can be the foundation of your farm accounting system . . .

Condensed from Kentucky Farmer

Wm. C. Johnstone,
Kentucky Banker's Association

NOWADAYS almost everyone keeps their money in banks and pays it out by checks. It reduces the danger of fire, theft, robbery and other losses. Payment of accounts and other obligations by check is the modern way to transfer money. A cancelled check, properly made out, is an undeniable proof of payment.

From the farmer's viewpoint a well-kept checkbook, with substantiating cancelled checks and deposit records, can be the starting point of a simple and accurate farm accounting system. And, in these days of state and federal income taxes, social security accounts, and what not, such accounts may prevent a lot of misunderstanding in governmental affairs as well as serve as a basis for better farm management.

Many farmers fail to get the full value of their checking accounts because either they do not know how to correctly write checks and fill out deposit tickets or do not care to benefit from good business methods. Checks and deposit tickets, when properly filled out, are evidence of expenditures and receipts that facilitate and substantiate entries in the account book. If all payments are made by check, and all receipts are deposited to the checking account, it is easy to periodically sort the cancelled checks and to list the deposits in such groupings as may be desirable for bookkeeping.

Care and accuracy in writing checks and in filling out deposit tickets is, therefore, an important part of good record keeping. From the standpoint of safety, as well as for accounting purposes, a person should observe a few simple rules in writing checks. Most important of these are:

1. Always use ink or an indelible pencil and do not make alterations or erasures.

2. Write the date on which

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the check is given. Do not predate it.

3. Write and spell correctly the name of the payee.

4. Fill in the amount to be paid, in numerals, in the place indicated at the right, placing the first digit near the dollar sign.

5. On the next line write, in script, the amount of the check, beginning near the left margin of the check and drawing a line between the dollar value and the cents, in fractions. These precautions are to reduce the chances of having the value of the check increased.

6. Fill in, as completely as possible, the purpose of the check.

7. Sign the check with the same signature as is registered at the bank.

8. Make a check payable to "cash" only when you are in the bank ready to cash it and never when you intend to give it to another person.

For further accuracy, the stub of the check should be filled out, preferably before writing the check, with the same information that is to appear on the check. If the checks in the book do not have the number printed on them, it will facilitate matters to prenumber them and the stubs before putting the check book in use.

If the checking account is to serve its full purpose in farm accounting, a record of deposits is just as important as the cancelled checks, hence every receipt of money should be deposited with a notation on the deposit ticket of the source and purpose.

Even if a neighbor pays cash for an item and the same amount is needed for household expenses, it is advisable to deposit the cash receipt and then to draw a check for the cash needed. In such cases the deposit ticket might indicate —"Jim Jones, cash for calf $25.00"; and the check—"Cash for household expenses . . . $25.-00." This will provide a record of each transaction.

All banks prefer, and many of them request, that the customers fill out their own deposit tickets. This is desirable from the depositor's standpoint because it assures that the deposit will be made to the right account and gives an opportunity to make a note on the ticket concerning the source of the receipt.

It is a good business practice to deposit all receipts, either cash or checks, as soon as possible after received. In the case of cash, this reduces the chances of spending it; for checks, it is only courtesy and good business.

Because the type of checkbooks and the forms used for making deposits vary from bank to bank, it is advisable to discuss your requirements with the banker.

Harvest Losses Can Steal Your Profits

Many farmers leave 20 bushels of corn and 10 bushels of soybeans in the field . . .

Condensed from Farm Profit
Ray Reiman

HOW MUCH of your harvest can you afford to leave in the field? If you're raising 100 acres of corn and 50 acres of soybeans, you may be losing $800 in corn, $400 in beans—likely more than enough to cover your picking and combining costs.

The USDA's report on agricultural losses says the average farmer leaves 8% of his corn crop in the field. Martin Wiess, chief of USDA field crop research, says farmers average a 4 bu. soybean loss. Total U. S. losses: a whopping $350 million in corn, $25 million in soybeans.

Don't be sure you're better than average when it comes to getting all the grain. Twenty champion corn pickers in Illinois left an average of 6% of the crop or 7 bu. per acre.

In Nebraska tests with corn at 18-20% moisture, losses averaged 9-12%. Ohio State's William Johnson made a survey of midwest experiments, came up with the same figures for corn picked on Nov. 1. On 100-bu. corn that could be $15-20 per acre.

Soybean losses are just as costly. USDA's Wiess says as many as 10 bu. per acre are often left in the field. On 50 acres that might cut your profit by more than $1,000.

"Half the world is on the wrong scent in the pursuit of happiness. They think it consists in having and getting, and in being served by others. It consists in giving and serving others."

—Henry Drummond

Eighty per cent of your soybean loss comes from shattering. Best to combine at about 14% moisture; below that, beans shatter easily. Complete the job first week in October of normal year if you live in the cornbelt. Other losses come from separating and from the cylinder. Watch for threshed beans in straw or unthreshed beans in straw or grain tank.

Average corn losses should be

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more than cut in half, soybean losses below 2 bu. per acre, says the USDA report. You can probably do better; many farmers do. Keep in mind that those extra bushels you save by using good machinery and proper adjustments, speeds and picking time are all profit. Livestock gleaning efficiency is often overrated; greatest loss by far is hard-to-recover shelled corn.

Main reason so much corn is left in the field is late harvesting. More corn shells off ears before it gets into the picker, ears are bumped off more easily and there's more chance that ears are blown down by wind.

Johnson's survey showed 2% losses on Oct. 1 jumped to 25% when picking was delayed until Dec. 15. In Iowa State tests losses soared from 3 bu. per acre on Oct. 28 to 16½ on Nov. 26. Biggest rise comes after Nov. 10, Dale Hull says.

Best solution to harvesting early is probably the combine or picker-sheller. When cobs are left in the field, corn can be harvested while moisture is high as 27%.

But whether you harvest with a picker or a combine, high moisture corn needs artificial drying to prevent spoilage. Dryers cost from $1,000 to $4,000 while custom rates run 5 cents a bu. and up. Many farmers believe it pays to invest in a dryer anyway, to prevent spoilage in wet seasons. Savings from a combine or picker-sheller through lower field losses, lower storage and handling expenses should more than offset drying costs.

The man and the condition of the equipment he's operating control a great deal of the losses, too. It takes a good machine, properly adjusted to the condition of the crop, to get as much of the corn and soybeans as possible.

But you won't get it all at high speeds. Drive 2½ m.p.h. under normal conditions, slower if yield exceeds 65 bu. per acre. In the Illinois contest the slowest operotors left the least corn.

Check your machine to see if you need repairs or new parts before the rush starts. Then start picking a week early so you can make the adjustments in time to take profits home.

Their Start in Life

Someone has made a survey of a thousand successful men to learn how they got their start in life. These men are not mere money-makers, but they are men who have made the world a better place by their work. Of the thousand, three hundred started as farmers' sons.

DAIRY FEEDS OF THE FUTURE

Researchers see more high-energy feed from grass-legume crops, more urea, molasses, fats . . .

Condensed from Certified Milk

EXPERIMENTAL feeding of dairy cows for high-level milk production and body maintenance is beginning to indicate what well-fed animals will eat in the years to come.

USDA dairy scientists are certain that high-energy feeds will top future menus that a dairyman selects for his herd. There will be adequate protein—but not an oversupply. Cows may also have greater access to such additives as urea, molasses, and tallow, as well as vitamins for relieving certain metabolic disorders.

High-energy feeds will come from the same sources as they do now. But dairy nutritionist L. A. Moore foresees an increased proportion of such feed coming from grass-legume pasture crops rather than from grain supplements as at present.

Grassland farming is becoming increasingly important. Research has already shown the high energy derived from grass-legume crops cut and stored as hay or silage at the optimum stage to provide the most in feed value. Test after test demonstrates that such crops provide the best feed when harvested well before maturity. In this condition, they supply a substantial part of the energy and protein-bearing feeds that cows need for high-level production. Grain is now the usual standby for this purpose.

The swing to grass-legume hay and silage doesn't mean that dairymen of the future will discontinue feeding grain concentrate. But it does mean they aren't likely to seek high-level protein feed in grain alone if other sources are available.

Grass-legume pasture crops will be one source. Another source may be urea as a feed additive. Cows, because they are ruminants, convert urea to amino acids and protein. Urea, made synthetically, is most effective when added to home-grown-grain rations. Such rations rarely contain more than 10 per cent protein—which permits the utilization of added urea by 60 to 80 per cent. In grain feeds (com-

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mercial) that have 14 to 18% protein, addition of urea is wasteful since utilization then seldom tops 40 per cent.

Use of urea in dairy-cow diets of the future will depend then—as it does now—on the cost of this product in comparison with the cost of grain feeds. It will pay, for example, if the cost of a pound of urea, plus 6 pounds of carbohydrate concentrates, is less than the cost of 7 pounds of protein concentrates from various sources.

Molasses has a definite place in feed rations for beef cattle, and its use in dairy rations can be expected to increase in the future. A byproduct of cane, beet, corn, and citrus sugar manufacture, "blackstrap" molasses serves the two-fold purpose of adding nutrition and palatability to feeds. It is frequently mixed with ground feeds and is even used as a pasture spray to increase the palatability, nutrition, and intake of low-quality pasture crops. Although its availability for feed use once depended largely on the demands of the alcohol industry, increasing synthetic manufacture of alcohol has left larger quantities of molasses for feed. Since 1943, the use of blackstrap molasses in feed has mounted steadily.

Replacement of soap by synthetic detergents has made available large quantities of inedible tallow. This product is being used successfully in cattle, sheep, and poultry rations. Its value as an ingredient of calf starter rations has been demonstrated. A ration containing 10 per cent stabilized tallow, fed at the rate of 4 pounds a day per calf, resulted in an increase of 5 to 6 per cent in the calves' rate of gain. Tallow cost will determine its future use as a feed ingredient.

Nutritionists see little chance of material change in the various minerals used in feeds. It is assumed that commercial manufacturers add the more common elements such as calcium and phosphorus, as well as sodium chlorine, and iodine in the form of salt. These feeds likely contain trace minerals such as iron, copper, manganese, and cobalt. All these, it may be expected, will be a part of mixed feeds of the future.

Work at the Ohio experiment station over a period of about 10 years has already shown that milk fever can be prevented in cows by feeding 5 to 30 million units of vitamin D daily for 3 to 7 days before the birth of a calf and 1 day after birth. Milk-fever-prevention rations, for use at such times, are offered by some feed companies. Greater use of vitamin D for this purpose in the future seems almost certain to develop.

How to Guard Against Leptospirosis

Every dairyman and hogman should be familiar with the symptoms of this new disease . . .

Condensed from Jersey Journal

Dr. Jack Bailey, D.V.M.

NOT SO LONG ago we talked to a farmer who was having what he thought was more than his fair share of trouble.

For one thing, many of his heifers were aborting at about the fifth month of pregnancy, in spite of the fact that they had all been calfhood vaccinated against Bang's disease. For another, a peculiar type of mastitis had appeared in his dairy herd, affecting both the aborting heifers and older animals that had calved normally.

Herd production was way down as compared with former years, and much of the milk was bloody, yellow, or so thick that it clogged strainer pads. Oddly enough, though, none of the udders producing this abnormal milk were swollen, and they were perfectly limp and normal-looking after being milked out.

In addition, many of the cows were showing a deep yellow color in the whites of their eyes, a few were off feed, and others were breathing too fast like they might have a touch of pneumonia. Two of the sick cows had been noticed as passing bloody urine.

As if this wasn't enough, several of his brood sows had also aborted their litters, most of them only a couple of weeks ahead of time. Some of the sows that had farrowed normally dried up suddenly so their pigs had to be taken away and raised as orphans.

One of his fattening shoats had died in convulsions, and a few of the others were somewhat weak in their hindquarters. An investigation showed that all of these various troubles were being caused by leptospirosis.

Although practically unknown until about three years ago, this disease has now been reported from at least 33 states. Not only that, it's been found on a discouragingly large number of farms.

An investigation in New York showed that it existed in about 6.4 per cent of the state dairy

Reprinted by permission from Jersey Journal, Columbus, Ohio

herds. In Washington reactors were found in 51 of the first 160 beef herds tested, and up to 75 per cent of some herds were reactors. Illinois reports that nearly one-third of the tested beef and dairy herds were infected, with 14.5 per cent of over 23,000 animals being reactors.

Even though none of your livestock have shown symptoms of leptospirosis,, the disease is still dangerous enough to guard against on your farm. The following measures are recommended for this purpose:

1. Test all purchased cattle, swine and sheep for leptospirosis before they are brought onto your farm.

2. Isolate such animals for 90 days and then retest them before turning them in with the home herd.

3. Keep your swine, sheep and cattle completely separated to prevent spread from one species to another.

4. Insist that semen for artificial insemination comes from bulls that have been tested for leptospirosis.

5. Don't use boars, bulls or rams that have been "changed" around the community, regardless of a clean test in the beginning.

6. Have show cattle vaccinated against leptospirosis a few weeks before they're taken to exhibits.

7. Don't vaccinate against leptospirosis unless there's already infection in the herd or on nearby farms.

8. Have your veterinarian blood test suspicious animals. There's no other way of telling leptospirosis from other diseases like Bang's and kidney infection.

9. Finally, don't forget that human beings can get the disease from livestock. Accordingly, use plenty of disinfectant and wear rubber gloves when you're helping animals at lambing, calving or farrowing time.

Highland Tragedy

Having noticed that his Scottish guide went bareheaded in all sorts of weather, the Dublin sportsman made him a gift of a fur cap, the kind that has heavy ear flaps for extra warmth.

On his next visit to the Highlands, he asked the old Scot how he liked the cap.

"I hae not wore it since the accident," was the gloomy reply.

"What accident," queried his benefactor.

"Jock MacLeod offered to buy me a drink," sighed the guide, "and I didna hear him." *From Irish Digest, Dublin*

Crossbred Steers are Moneymakers

That is what these two ranchers found when they tested the gaining abilities of Charbray-Hereford cross-bred steers.

Condensed from
Western Livestock Journal

Wilburn Pickett

"COME see for yourself." That's the answer most folks get when they ask Leslie and Tell Gardner about the difference in gain between their Charbray - Hereford crossbred steers and their straight Hereford steers.

Three years ago, out of curiosity, these two brothers began crossing Charbray bulls onto their registered Hereford cows. And last November, they started feeding out the steer calves on an experimental basis.

They fed 35 head of the crossbred steers and 35 head of the Hereford steers at their ranch at Venice, Utah. All of the steers were born within two weeks of each other.

Les and Tell put the steers on feed Nov. 17 after making an initial weight check of the two groups. At that time, they notched the ears of five crossbreds and five Herefords, so the same animals out of each group could be weighed at each check period. Then, both groups of steers were weighed five different times, including the initial weighing, Jan. 9, March 6, April 14 and June 7.

At the final weighing, June 7, the crossbreds averaged 1,168 lb. each. This is a total gain per steer of 566 lb. during the 204-day feed period, over their initial average weights of 602 lb. each. The Hereford steers averaged 937 lb. each at the final weighing. They showed a total gain per steer of 513 lb. during the same feed period, over their initial weights of 424 lb. each.

So, over the 204 days on feed, the crossbred steers gained 231 lb. more than the five Hereford steers, and ran up an average daily gain of 2.78 lb. This was one-fourth of a pound more gain per day than the 2.53 lb. daily gain averaged by the Hereford steers.

These two groups of steers were

Reprinted by permission from Western Livestock Journal, Los Angeles, Calif.

calved out of the same cow herd, the only difference being that one group was sired by a Hereford bull while the other was sired by a Charbray bull. Rations for the two groups during the 204-day period were the same. From Nov. 7 to the middle of January, both groups were fed a daily ration of corn silage, 2 lb. grain and alfalfa hay. After the middle of January, a mixture of stilbestrol and milo, plus some barley, was added to the regular ration.

Even with the interesting results obtained from feeding these groups of steers, it was the crossbred steers marketed last year that sold the Gardners on the value of Charbrays.

Those steers brought a premium of 50 cents a hundred over the Hereford steers sold at the same time. The steers were bought by Swift & Co., out of San Francisco. The Gardners asked the buyer to send them dressing percentages on the animals. And, they were interested to find out later that the crossbreds dressed out at 62.26%, which was higher than that of the Hereford steers.

Realizing the possibilities of crossbreds, Les and Tell went to the packinghouse to take a look at the crossbred carcasses hanging on the rail. In the coolers, they noticed that the crossbred carcasses showed less fat and more marbling around the loin than carcasses from straight-bred animals.

A buyer from Ft. Collins, Colo., who has developed a strong trade for this type of crossbred beef in Colorado restaurants, now wants to buy all the Gardner crossbred steers for 50 cents per hundredweight over what they will bring at the peak of the Denver market.

These two brothers definitely prefer the crossbreds. Yet, their estimation of these animals as money makers goes past the feedlot. "We haven't had a bit of calving trouble with any of our cows bred to Charbray bulls since we began three years ago," said Les Gardner. He feels this is due to the crossbred calves being smaller—almost tiny—and somewhat on the slim side at birth.

But, Les quickly pointed out that the calves were much larger than Hereford calves at weaning time. "The crossbred calves do exceptionally well on our drouth-ridden ranges here, too. And, in our salt grass pastures, the crossbreds gain steadily, while our Hereford calves just hold their own or even lose weight sometimes."

Tell says the crossbreds aren't as excitable in the feedlot as Herefords are, and they handle much easier. "When we are vaccinating," he explained, "They stepped right up into the chute, stopped and hardly moved until

we let them out."

He also said that at weaning time, the Hereford calves bawled and gaunted up pretty badly. But, after a little bawling, the crossbreds went right after their first feed.

Another thing Les and Tell like about crossbreds is the way they stand the winter. They do just as well during the bitter cold winters in Sevier County as they do in the hot, dry summers. He also stated that gains were as high in the winter as they were during more favorable weather.

Tell added that their neighbors and their brothers, all cattlemen, thought they were crazy at first for trying the crossbreds in an area that has been historically Hereford country for over half a century. "But now that they've seen what crossbreds can do, they aren't so skeptical," said Tell. There's now a constant stream of visitors, neighbors, and folks from out-of-state who drop in at the ranch for a quick look and wind up spending the day looking at the cattle, according to the two brothers.

Costs of Storing Wheat

Do you know how much it costs to store your reserve stocks of wheat?

Well, you can get some idea from these facts. They are the results of a recent Agricultural Marketing Service study of the costs in western Kansas. There, the annual costs for storing in the large country elevators have dropped almost three cents a bushel, from 10.21 cents to 7.33 cents.

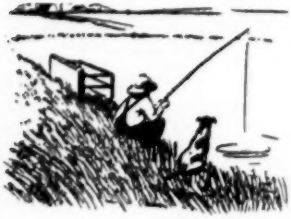
But these costs only decreased when the elevators were used to their full capacity. For instance, in using a 100,000-bushel elevator it cost 19.3 cents a bushel more if it were only one-quarter filled. And in the larger elevators, it's cheaper yet.

The more use you get out of your elevator, the cheaper it will cost.

These same general conditions hold true for wheat stored in farm storage bins. Bins only half filled to capacity usually ran costs up some 50 per cent.

So if you store your wheat in these storage bins, store them full. The report showed that costs decreased from about 10 cents a bushel for the 2200-bushel bin to 6.87 for the 13,104-bushel bin. This means a cost savings of about 3 cents a bushel for wheat stored in the large units. *New Mexico News*

Bentonite May Double Your Water Supply



Got a seepy irrigation ditch? This idea may save valuable water . . .

Condensed from Western Farm Life

Ken Goodrich,
Colorado A. and M. College

HOW WOULD you like to double your irrigation water supply? You could do just that in many cases, if you stopped seep losses from your delivery ditches. If your ditches are typical, you are losing from 10-90 per cent of your water from leaky channel beds. Average loss is around 50 per cent—and that is a lot of water!

The new bentonite ditch lining now being developed by engineers looks like our best tool yet for combatting these expensive water losses. It stops 50-90 per cent of the leak loss—depending on what kind of soil the canals run through. The lining is economical and easy to apply. Bentonite clay is mined in Wyoming, the Dakotas and Montana. Lower grades of bentonite are found in most other western states.

Main drawback to other linings is their cost. You can seal seven miles of canal with bentonite for the same amount of money it takes to line one mile of canal with the cheapest kind of lining now in common use. In fact, you can put in a bentonite lining for about the same time, money and effort that it takes to clean your canals. Bentonite lining has been applied by the full-flow method for as little as 5 cents per square yard.

This new lining method has worked well at test sites. And these test canals were picked for lining because they were real trouble makers. They run through soils that present the most problems from seepage.

Two years ago R. D. Dirmeyer, Colorado A & M project leader on ditch lining, supervised lining of a two-mile lateral for the North Poudre Irrigation Company north of Ft. Collins, Colo. The lateral runs through sandy soil. Ten tons of bentonite were used to do the job at a total cost of $300.

Measurements show that the lining has stopped 100 acre-feet of water from leaking out each summer for the past two years. The ditch company values this

Reprinted by permission from Western Farm Life, Denver, Colorado

water at $10 per acre-foot. This has meant a saving of $1000 each irrigation season—more than 300 per cent annual return on the original investment. The ditch lost 50 per cent of the water that entered it before sealing. Leakage is now 7 per cent.

Four hundred tons of bentonite were used to line a large, main canal in central Nebraska. Twelve miles of the channel were sealed in 11 days at a cost of $15,000. Water saved after one irrigation season has a value to water users amounting to nearly $80,000. This is a conservative figure, using the value of $15 per acre-foot for the water saved.

Bentonite can be used to save land as well as water. Water that leaks from a lateral can cause nearby land to become seepy—causing small bogs and lakes to form.

In one test, 10 miles of channel were sealed with bentonite, and the water table was lowered from one to three feet under land near the lateral. A strip of land three miles wide and 10 miles long was brought back into production. Lakes fed by ground water are now lower or have dried up. The $11,000 investment has paid off and shows promise of more benefits in years to come.

This land-saving aspect of bentonite lining has stirred the interest of the largest irrigation company in this country—the Imperial Irrigation Company that services thousands of acres of land in the Imperial Valley of California. In California, irrigation canals run the year around. And farmers often apply as much as 10 acre-feet of water per acre of land during the long growing season, as compared with two or three acre-feet per acre per year in Colorado.

Land in the Imperial Valley is being subjected to a slow, creeping death as water tables rise and bring on salt problems. Irrigation experts figure that the trouble could be lessened or eliminated by keeping water within the delivery canals that stretch for miles through the valley.

The lining is easy to apply—you just let the water in the canal lay the seal for you. There's just a short interruption of canal service while the lining is applied. A mile or more of large canal can be lined in a day.

Canal lining is just imitating a process carried on by mother nature called silting. Bentonite refines this process and makes it more efficient. The trouble with a natural mud cake is that when no water runs in the canal the cake dries and cracks and you've the problem of leakage all over again.

Bentonite particles are different from ordinary silt particles because they are extremely fine in size. During the lining process

the bentonite is placed in suspension in water. When water leaks out of cracks and crevices, the bentonite goes with it. It penetrates deep into a crack and builds up until the crack is filled with bentonite particles and sealed off. The lining process takes place below the surface of the canal and cannot be washed away by the ditch water that flows over it. And there is no problem of drying and cracking when there's no water in the ditch.

Never let fluid milk stand in the light, says the U. S. Department of Agriculture. This reduces its riboflavin content. Keep milk cold and covered. Bottled pasteurized milk, properly kept, has good flavor up to 3 or 4 days after delivery, but changes to poor flavor after 5 or 6 days.

The life expectancy of bentonite linings can't be predicted because the oldest linings have been in use only two years. But there has been no noticeable deterioration in the linings during their second year of use.

There are two methods of lining a canal with bentonite: the full-flow method and the ponding method.

The full-flow method is favored for small canals and those where water flow can be interrupted for only a short time. An air compressor is the only special equipment needed for this method.

Here are the steps: start with a dry ditch and clear the ditch of weeds. Place dry bentonite in a foot-thick layer on ditch bed at the head end of the section to be lined. Place a check dam below the bentonite. Turn in ditch water and allow to fill ditch and overflow check structure. Using a jet pipe attached to air compressor hose, muddy up the bentonite layer on canal bed.

The boiling action created when the compressed air is jetted into the bentonite layer places the clay particles in suspension in the water. The bentonite-water mixture flows down-stream, sealing the canal on its way. You don't have to look for the leaky sections of the canal, as the job is automatically done for you.

Also, the sealing action takes place only where there are leaks. No leaks, no lining. No special skills are necessary to put in bentonite lining using the full-flow method.

The ponding method is best used on large canals. Irrigation check structures that are already in existence are brought into play. A special mixer homogenizes the bentonite in water at the head end of the canal. This homogenized bentonite-water mixture is allowed to fill the section of

the canal behind the first check dam, overflow into the next checked-up section, and so on until the mixture runs the entire length of the canal being lined. A 12-mile canal has been lined with this method.

Engineers working with bentonite lining don't hold up the product as a cure-all for canal seepage troubles. Studies now are aimed at finding out just how far we can go with bentonite to seal canals. One thing is certain —this new method requires some adaptation to meet different problems presented when canals run through different soil types. Best results to date have come from lining canals running thru sandy and silty soils. Results have been less favorable in rocky and gravely soils. With more research, engineers are confident these problems can be licked.

At the present time it is not known how much damage will be done to a lined canal by weed cleaning, but there should be little or no damage if reasonable care is used. Since most test plots have paid off for themselves in one year, even if repair work had to be done after ditch cleaning, the linings still would pay for themselves.

Another thing that needs to be studied is the effect of bentonite on cropland. Research is planned in this connection, but no results are available at this time. With the lining method recommended here all of the bentonite is used up in the lateral being treated. The amount of bentonite that can be picked up later in normal irrigation deliveries seems to be negligible. Normal muddy irrigation water would contain more of this type of clay than could be picked up. Bentonite is similar to clay materials found naturally in the soil.

The cost is from $1-$3 per ton unprocessed at the plant; from $10-$40 per ton processed and sacked at the plant. Either processed or unprocessed bentonite can be used.

Sheep are adapted to either good or poor land.

Each ditch has a different personality in determining how much bentonite to use. Rates vary depending on size of wetted perimeter of ditch, length of ditch and degree of perviousness of soil that forms the ditch channel. A good formula to start with is one to four tons of bentonite per second foot of water capacity of the ditch. The best thing to do is experiment on a small section of ditch.

Costs in tests have ranged from 5 to 10 cents per square yard of lining. This includes cost of material, equipment and labor. A good average is about 7 cents per square yard.

Dehydrated Alfalfa Meal Improves Low-Quality Roughages

Research at Texas A. and M. College compares rates and costs of gain of Hereford steers . . .

Condensed from
American Hereford Journal

J. K. Riggs and *J. W. Gossett,* Texas A. and M. College

CATTLE feeders have long recognized that alfalfa hay is a desirable addition to rations in which considerable low-quality roughage is used. Experimental evidence indicates that supplementing such rations with alfalfa hay or alfalfa ash increases their digestibility.

Artificial dehydration in recent years has made available large quantities of dehydrated alfalfa meal, leaf meal and stem meal. Since the first two of these meals have higher protein and carotene content than field-cured alfalfa hays, they should be even more useful when added to or substituted for low-quality roughages.

The study reported here, was conducted at Texas A. & M. College to determine the effect of adding alfalfa leaf meal to low-quality prairie hay to be fed growing beef calves. Gain, feed utilization and blood plasma carotene levels were considered.

Four Groups of 10 Hereford Steers

Forty Hereford steer calves were divided into four groups of 10 each as nearly alike as possible in weight and grade. One group served as a check for comparison and was fed a basal ration composed of 2 pounds of cottonseed meal, 4 pounds of ground sorgum grain and 8.12 pounds of low-quality Gulf Coast prairie hay. The other three groups were fed the same ration except that dehydrated alfalfa leaf meal was substituted for prairie hay at levels of 1, 2 and 3 pounds, respectively. Thus the intake of protein supplement, sorgum grain and roughage as well as of total feed was kept the same. All groups had free access to a mineral mixture composed of 50 per cent steamed bone meal and 50 per cent salt.

Blood samples for carotene determination were drawn at the beginning of the experiment from

Reprinted by permission from Hereford Journal, Kansas City, Missouri

10 steers taken at random. At the end of the 100-day feeding period, blood samples were drawn from all 40 steers, and the same determinations were made. Samples of the ration were taken periodically and carotene determinations made.

Steers in groups 2, 3 and 4, which received rations supplemented with 1, 2 and 3 pounds of dehydrated alfalfa leaf meal, respectively, gained an average of 1.31 pounds. This was significantly higher than the 1.15 pounds gained by steers not receiving alfalfa leaf meal and represented an increase of 15.4 per cent in gain.

Differences in daily gain made by steers fed the three levels of dehydrated alfalfa leaf meal were not statistically significant, but gain did increase with increased amounts of alfalfa meal fed. Digestible protein, calculated net energy and carotene all increased when the level of alfalfa meal was raised. Therefore, part of the increase in gain must be attributed to these sources and not wholly to any mineral or ash content of the alfalfa meal.

While feed intake was held constant for all groups, feed per cwt. of gain was definitely lower for the steers fed alfalfa meal. The three groups fed alfalfa leaf meal required an average of 1,067 pounds of feed per cwt. of gain, compared with 1,268 pounds for the control group. This was a decrease of 15.2 per cent in feed requirement per unit of gain. Steers in Group 4 which received 3 pounds of dehydrated alfalfa leaf meal, required 22 per cent less concentrates and 24 per cent less roughage, or 23 per cent less total feed, per hundredweight of gain than the steers receiving only the basal ration.

Lowers Cost Slightly

With feed prices which prevailed during the past winter, the use of dehydrated alfalfa leaf meal at levels up to 3 pounds per head daily cheapened the cost of gain slightly as compared with the check ration which did not include the leaf meal. The cost per 100 pounds of gain for cattle fed the check ration was $18.76 as compared with $17.38, $18.14, and $18.53 for the 3 groups of cattle fed 1, 2 and 3 pounds of dehydrated alfalfa leaf meal per head daily, respectively.

Cottonseed meal was charged at $60, ground milo at $34, prairie hay at $20 and alfalfa leaf meal at $50 per ton. The prairie hay at $20 seems out of line for hay of low quality but the cost of harvesting, baling and hauling nearly precludes any lower price even on straw in this area.

When dehydrated alfalfa leaf meal was added to the ration in this experiment, the blood

plasma carotene content increased significantly.

The average plasma carotene in steers which received 1, 2 and 3 pounds of leaf meal was 142 milligrams per 100 milliliters of plasma, compared with an average of 55 milligrams for steers which did not receive the supplement. The average plasma carotene of steers fed 3 pounds of leaf meal increased 90 per cent over their initial level and 200 per cent over steers in the check group.

No significant differences were noted in the plasma carotene level of alfalfa leaf meal, but plasma carotene did increase as the amount of leaf meal fed increased. When the experiment was concluded, all steers receiving leaf meal had significantly higher levels of carotene in the blood than steers fed only the basal ration. Blood carotene levels of steers not fed dehydrated alfalfa leaf meal had decreased 40 per cent at the close of the test, but the steers did not show symptoms of vitamin A deficiency.

Farm population starts leveling out after long decline. About 22 million people now live on farms, well under the post-war peak of 27 million set in 1947, but about the same as during the past three or four years. The swift mechanization of agriculture, which chased many farm folks to the city, now progresses more slowly. Extension of Social Security coverage to farmers also keeps some on the farm to qualify for payments.

Summary

Small amounts of dehydrated alfalfa meal or leaf meal are beneficial to rations of low to average-quality grass hays.

Levels of 1, 2 and 3 pounds of dehydrated alfalfa leaf meal substituted for like amounts of low-quality prairie hay in growing rations for wintering steer calves increased their gain 15.4 per cent on the average and reduced feed requirement per unit of gain 15.2 per cent in this experiment.

The level of vitamin A nutrition also was improved markedly. The level of carotene in the blood plasma of steers fed 3 pounds of dehydrated alfalfa leaf meal per head daily increased 90 per cent during the 100-day test, and at the close of the test was 200 per cent above the carotene level found in the control steers. The plasma carotene level in steers not receiving alfalfa leaf meal decreased 40 per cent during the test.

Machinery Maintenance: Year Around Money Saver

Maintaining your equipment right makes a big difference at trade-in time . . .

Condensed from Ford Farming
Ed Spicer

PRICE the used equipment on the lot at any dealership. You'll find price varies greatly with the condition of the equipment. The man who practices regular machinery maintenance — greasing, oiling, adjusting, housing — may have received as much as $200 more for the same model tractor than the man who neglects maintenance. And you can figure he saved more by avoiding breakdowns with resultant crop losses and by saving fuel.

Lubrication, like other maintenance practices, is important the year around. Owner's manuals are the best guides for regular inspection and lubrication. As a rust preventive, grease saves money in unsuspected ways. For example, a coat of grease on an idle plow not only makes it last longer and plow better, but it saves gasoline, too. Plowing at any speed takes 15 to 20 per cent more tractor power with a rusty, pitted plow than with a shiny moldboard and sharp share.

Transmission and differential gears need fresh lubricants after a season of heavy work. Wheel bearings should be cleaned, repacked and adjusted regularly. The steering linkage and distributor need lubrication frequently and oil in the steering gear housing should be kept at proper level. A handy reminder to keep machinery greased is a grease gun carried on your tractor. You can get a gun and carrying bracket from your dealer.

Keeping machinery in proper adjustment can save much time and money. It's a good idea to inspect periodically for loose nuts

Sign of Honesty

A little gas station on the edge of an Arizona desert displays this sign: "Don't ask us for information. If we knew anything we wouldn't be here." —Anne Hughes

Reprinted by permission from Ford Farming, Birmingham, Michigan

and bolts. During adjustment and inspection, special attention might be given to worn parts. Replacement of a weakened chain or frayed belt may prevent downtime in the field. A cracked harrow frame can be welded quickly. If left, it might break down in use.

Population & Income in 1965

The nation's population is expected to reach 185 million by 1965. Figuring from present trends, the economists expect a 30 per cent increase in per capita disposable income by 1965. The people of this country have traditionally spent about 5½ per cent of their disposable income for meat, according to the National Live Stock and Meat Board.

Engines must be kept in good repair and adjustment. Fuel losses are unbelieveably high where minor adjustments and service are neglected. Carburetor adjustments, spark timing, grinding valves, and cleaning the air filter all help to save fuel. For example, it may be as wasteful to set the carburetor too lean as too rich, and the flow of fuel may need to be greater rather than smaller. Fuel is wasted by closing the choke adjustment to provide a richer mixture when starting a tractor and failing to open it when the engine is warm.

Keeping machinery under cover isn't always possible, but a practical machine shed will pay for itself over a period of years. Planters and harvesting equipment are more subject to deterioration due to weathering. Chains rust, become stiff and are more easily broken during the busy season. Belts rot and may cause field breakdowns and loss of crops. A machine shed not only protects equipment from weather, but it provides a place to work on machinery during bad weather when there's time for this.

Calves that are unthrifty, pot-bellied and anemic may be infested with stomach worms, according to Purdue University veterinarians. Sanitation, cleanliness of the barns, and rotation of pastures are methods of controlling these parasites. Your veterinarian can make a microscopic test of droppings to determine if worms are present. Effective treatment can then be used for the specific kind of worm found.

If you've misplaced the owner's manuals for your machinery, ask your dealer about them. Protect your investment in farm machinery.

WANTED: A New Crop for Farmers

A newspaper publisher . . .tired of paying higher prices . . . tosses a challenge to American Scientists . . .

Condensed from Northern Virginia Daily

IN RECENT YEARS United States scientists have made so many discoveries and inventions that they have virtually changed the whole way of American life.

Freezing units, radio sets, modern automobiles and airplanes, televisions, air conditioners, not to mention the atomic and hydrogen bombs, have had a terrific impact upon our daily customs and thinking. Our economy and our habits have been adjusted to all these improvements and innovations.

But in the field of agriculture our scientists have so revolutionized methods of farming that our rural economy has been thrown out of balance. Farmers are now growing two, three and four blades of grass where one formerly grew. As a result, we have over-production of many agriculture products and this in turn has brought economic and even political chaos to the farm belt.

If our scientists would work as assiduously on developing new crops for our farmers as they have on other discoveries, it would seem the matter of surplus crops could soon be solved. Such development would be a great boon to farm life and to our whole economy. As an example of what might be attempted, let us consider one possibility.

American newspaper publishers have to purchase practically all of their newsprint from Canadian mills. About twenty years ago

The real measure of our wealth is how much we would be worth if we lost our money.

the base price of Canadian newsprint delivered to most points in USA was around $40.00 per ton. In those days all newsprint was made from hardwoods. Today the price is $130.00 per ton and there is almost constant short supply.

In recent years scientists discovered methods of extracting

Reprinted by permission from Northern Virginia Daily, Strasburg, Virginia

rosin from pine woods. As a result several huge newsprint mills have been built in the South. Around these mills, pine is now cultivated as a staple crop, but about ten years is required under the best conditions to grow pine to the proper size for manufacturing newsprint. But even with these new and modern mills and with Canadian mills operating at full capacity, the supply of newsprint has scarcely been able to keep up with American newspaper demands.

Now let's go back to the grass farmer! In many parts of the United States grasses and clover for making hay are cultivated, baled and sold at prices ranging around $40.00 per ton. These are not particularly prolific or voluminous strains. If our scientists could develop strains of grasses that would grow in great volume, perhaps improved varieties of such species as sudan, sorghum, large fescue, marsh grasses, or even palmettoes, it would seem that methods could be devised for making these fibrous grasses into newsprint. It is evident that there would be a margin of at least $80.00 to $90.00 per ton between the price farmers receive for baled hay and the price American newspapers are paying for newsprint. That would probably more than take care of the cost of manufacturing newsprint.

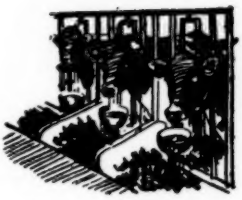
No doubt the cultivation of such grasses and the location of resulting newsprint mills would have to be in the mid-West and Southern plains states where great quantities of the grasses could be grown and harvested economically. Such a new agricultural product would take thousands of acres of land out of wheat, corn and cotton production, all of which are in great surplus and are costing the American taxpayer millions of dollars annually for storage alone.

We believe this suggestion offers a challenge to American scientists. The discovery and use of such a new crop would greatly benefit the hardpressed farmers, it would offer relief to our newspapers, and it would strengthen the weakest link in our national economy.

Success is getting what you want; happiness is wanting what you get.

Dry cows require some concentrates but the large amounts fed on some farms are unnecessary, report dairymen at Purdue University. Feeding tests prove that four pounds per cow daily are ample as long as there is a good supply of roughages.

A Ton of Protein Per Acre



How this goal of high quality grass and increased protein is rapidly being achieved.

Condensed from New Jersey Farm and Garden

Carroll H. Ramage

IN THE not-too-distant future, dairymen may be getting a ton of protein per acre of forage. So much protein that they will be feeding "protein poor" supplements to dilute the protein in their forage.

Advances in methods of manufacturing fertilizer, the pressure for more production per acre due to increasing value of agricultural land, and research to show that higher yields of protein may be obtained — this combination of factors makes such a prediction possible.

For three years, workers at the New Jersey Dairy Research Farm have obtained protein yields of up to 1,917 pounds per acre with forage grown under heavy fertilization and cut at the proper stage of maturity.

Such yields have been obtained not with the use of special crops, nor by clipping with a lawn mower every week or so, but with grasses (orchard grass and reed canary grass) cut three times during the season, with a total yield of hay of five tons per acre.

However, large amounts of fertilizer were required to produce such yields. Four hundred pounds of nitrogen per acre, plus enough phosphorus and potassium to meet the heavy requirements for these elements at high yield levels, were necessary.

Total fertilizer cost per acre at the 400-pound nitrogen level was $86. When this cost is divided by five tons of high quality hay and 1,900 pounds of protein, the fertilizer cost becomes $17 per ton of hay and 4½ cents per pound of protein.

Two hundred pounds of nitrogen per acre on grasses produced 1,230 pounds of protein and four tons of hay. The fertilizer cost in this instance was $48 per acre.

When alfalfa-grass mixtures were grown, the cost of the protein was even less. Alfalfa-brome grass fertilized annually with 750 pounds of 0-20-20 produced almost four tons of hay containing

Condensed from New Jersey Farm and Garden,
Sea Isle City, New Jersey

1,350 pounds of protein per acre. Total fertilizer cost on this alfalfa-grass mixture was $22 per acre.

Nitrogen added to alfalfa grass mixtures at rates of 75 and 150 pounds per acre increased the percentage of grass in the mixtures, did not increase the yield, and slightly lowered the protein content of the forage. Applying 300 pounds of potassium per acre to alfalfa-grass mixtures gave only slight increases in yield over the 150-pound application, and did not change the protein content.

At the beginning of the fourth years of production, the grass stands were weed-free and afforded complete ground cover. The alfalfa-brome grass mixture, on the other hand, was quite weedy and showed considerable bare ground.

Although long drought periods were encountered during the three-year growing period from 1953 to 1955, the grasses fertilized with nitrogen continued to grow throughout the season, making much better use of the available moisture (through a more extensive root system) than unfertilized grass.

On such unfertilized grass, only two cuttings per year were obtained, for a total yield of about 1½ tons of hay per acre containing about 10% protein.

Early cutting is the key to high quality forage production, and this is particularly true in the case of grasses. During the three-year experiment with the grasses, orchard grass was cut on May 15, May 11, and May 13 for the first harvest. It was cut a second time on June 22, 1954.

A delay in harvesting of only a few days will seriously lower the quality and the protein content of grass. The effect of delay is much more marked with grass than with alfalfa or alfalfa-grass mixtures. For this reason, it is usually advisable to harvest the first cutting of grass as grass silage, since the weather in May is generally not very favorable for haymaking. If a hay drier is available, the field drying time may be considerably reduced and the quality of the hay improved.

Early cutting resulted in forage much higher in total digestible nutrients than the 50 or 52% commonly assumed for forages. Preliminary trials on digestion using second cutting orchard grass gave TDN values of 64 to 65%.

This increased TDN value of the forage plus the abundant protein content, may mean that in the future the dairyman may be feeding lower protein concentrates, and less concentrates since the high quality forage produced under heavy fertilization will more nearly approach concentrates in milk-producing value than forage produced under low levels of fertility.

IRRIGATION
Sure Way To Abundant Pasture

These farmers have found the answer to dry weather. It may not take as many acres as you think to supply your herd with good pasture in times of drought . .

Condensed from Kansas Farmer

Dick Mann

WHAT PRICE would you have been willing to pay these last few years for a "sure" pasture program for your livestock? Stabilizing pasture and feed production certainly has been the No. 1 problem on thousands of farms for some time now, due to dry weather.

Some farmers have found the answer in irrigation and it may not take as many acres as you think. In fact, Kenneth Jameson, Comanche county agent, says: "A common error farmers make, is wanting to irrigate too much land. It is better to do a good job of irrigation on a small acreage than a poor job on a large acreage."

A good example of doing a good job on a small acreage is Cliff Henderson, dairyman living near Coldwater, Kansas. He put in a modest sprinkler irrigation system in 1955 at a total cost of $3,500, getting his water from a shallow well. He irrigated 15 acres of alfalfa, 10 acres of balbo rye and 20 acres of Sudan. His rye field was later summer fallowed and seeded to alfalfa.

By doing a good job of irrigation Mr. Henderson had the following results: "I didn't have to buy any roughage this past winter and had 50 tons of hay left over," he reports. His alfalfa made slightly more than 7 tons an acre.

His 19-cow dairy herd was put on Sudan pasture July 1 and kept there until September 1, when the Sudan was plowed under and balbo rye seeded. Balbo pasture was available about October 15, and cows had pasture there most of the winter. "Without my irrigation system," says Mr. Henderson, " I would have had no Sudan or rye pasture and would have harvested less than 2 tons of alfalfa an acre." Rotation grazing is practiced, with electric fence being used to fence off the pasture areas.

Reprinted by permission from Kansas Farmer, Topeka, Kanssa

The alfalfa received 200 pounds of 45 per cent superphosphate an acre last spring and 250 pounds this spring.

Another Comanche county dairyman, Wallace White, has insured pasture for his 55 head of cattle by irrigating wheat for winter pasture and Sudan for summer pasture. "I can't use balbo rye pasture," he explains, "because I grow certified wheat."

Mr. White irrigated 140 acres of wheat last year. Cattle were pulled off early in April when wheat began to joint. "I would not have had any wheat pasture except for irrigation," he says.

Irrigate Sudan Pasture

Fourteen acres of Sudan were irrigated with another 22 acres of Sudan unirrigated to use while watering the irrigated acreage. To further bolster his feed supply, Mr. White irrigated 26 acres of atlas this last year. Sixteen acres harvested for silage made a total of 260 tons. The rest was harvested for seed.

Neil and Dan Jackson, Comanche county beef producers, have had similar success with irrigated pastures. They use a sprinkler system to water 50 acres of alfalfa and 85 of rye and vetch.

Last October 29, they put 250 calves on the alfalfa and pastured off the fifth cutting. Calves remained on this alfalfa until December 11.

On November 13, the ranchers put 29 head of calves on rye, added 55 more head on January 5, added 59 more head on March 26, and 100 steers and 25 cows on April 2. These cattle are pulled off rye about May 20 and the rye is later harvested for seed. The last 2 years this irrigated rye produced 10 bushels of Balbo seed an acre, which sold for $2 a bushel. Thus, the grain production paid irrigation cost.

Four applications of water on the 50 acres of alfalfa returned more than 11,000 bales of hay, or more than 7 tons an acre in 1955. No fertilizer was used on the alfalfa in 1955, but 250 pounds an acre of 45 per cent superphosphate were applied this spring.

The Jackson irrigation well will produce from 900 to 1,000 gallons per minute. The system was operated for 3,205 hours in 1955 at a cost of 56 cents an hour for fuel and oil and $1.02 an hour for total cost.

At the Garden City (Kansas) Branch Experiment Station the largest milk production per acre has been obtained on irrigated alfalfa-brome pasture. In 1953, these tests showed the following returns: alfalfa-brome, 7,986 pounds of milk per acre; ladino-brome, 5,878 pounds; sweet clover-brome, 4,787 pounds, and

birdsfoot trefoil-brome, 3,187 pounds milk per acre.

Andrew B. Erhart, superintendent at the station, says: "In managing irrigated pastures for maximum returns they should be rotated to permit watering, regrowth and proper utilization. Water requirements are high (32 inches) and root zone is shallow (3 feet) so more frequent irrigation will be required. Heavy applications (100 pounds of N) of fertilizer may be required if no legume is in the rotation."

Watch Out For Bloat

Care must be taken in pasturing some irrigated crops, says Mr. Erhart. "Sudan grass may cause prussic acid poisoning if pastured before it gets 18 inches tall or after frost. Legumes may cause bloat."

The following precautions against bloat are suggested: Don't graze early lush legumes. Keep dry hay before animals on pasture. Leave animals on pasture day and night. Have water and salt available. Use strip-grazing. Field chop and feed in bunks.

U. S. milk industry is the second largest industry in the country, exceeded only by steel.

"Irrigation is the key to stable year around pasture," says Walter Selby, Kansas State College Extension engineer. There are 2 methods of irrigating pastures, he adds. These are by surface or sprinkler irrigation. Best surface irrigation can be done by bordering or by corrugations, using syphon tubes or gated pipe to get water where you want it. You can also irrigate with contour ditches, says Mr. Selby.

Block and Loose Salt Are Equal

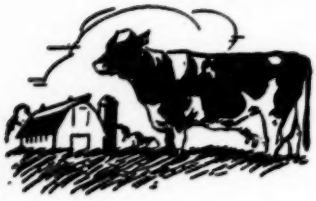
Which is better for dairy cows — loose or block salt?

Both are equally good, says Donald L. Murray, extension dairyman at Michigan State University. He cites Cornell University tests to make his point.

At Cornell, dairy cows on pasture ate more loose salt than block salt. But the cows on block salt got enough salt for good milk production. The scientists found that a cow needs about one ounce of salt per day besides the salt in her natural feed.

If she doesn't get that ounce, she may lose weight and drop her milk production. And she may chew on anything — from wood to leather. —*Michigan State College*

Brucellosis



The Milk Ring Test recently approved by the U.S.D.A. offers great possibilities for the eradication of this insidious cattle disease . . .

Condensed from
Guernsey Breeders' Journal

Boyd Christenberry

BRUCELLOSIS is the biggest dollar-snatching livestock disease in America. Commonly known as Bang's disease, brucellosis runs up an annual bill of around $58 million. And a big slice of this tremendous loss comes out of the dairyman's pocket.

These are some of the strong words of warning sounded in Alabama by John Parrish, Extension dairyman. Alabama dairymen are high among millions throughout the nation who are taking a beating from Bang's. Their loss of milk and calves, plus the cost of raising or buying replacements, reaches the staggering sum of four million dollars annually . . . far more than the state's share of total losses.

Such facts paint a black picture, but fortunately there's a brighter side. Mr. Parrish feels confident that the dairymen can knock out Bang's. The only condition, he says, is that they must cooperate completely with the U. S. Animal Disease Eradication Branch and the state veterinarian's office in the new expanded brucellosis eradication program. One of the big features of the expanded control program is the Milk Ring Test.

Mr. Parrish explains how the ring test is used in Alabama to track down Bang's-infected dairy herds. (A similar procedure is followed in other states having the ring test.)

In six "receiving stations" in the state's major milk producing areas, a mobile Bang's laboratory, staffed with a serologist, a veterinarian, and a technician, is testing herds. The lab remains at each station four to six weeks—long enough to test all herds in the area. The unit will revisit each station every four to six months. Therefore, dry cows missed one time will be tested the next.

Reprinted by permission from Guernsey Breeders' Journal, Peterborough, N. H.

The technician collects milk samples from each can of milk at dairy plants. When bulk tanks are used, the technician goes with the pick-up truck and collects samples at each farm. Samples from each can of milk are taken with a metal dipper that holds about a teaspoonful. The dipper is washed every time a sample is taken. Samples from different herds are kept separate. Samples from one to three cans are put into one test tube. This means that milk from only five to 12 cows is put into one tube. Therefore, several tubes may be needed to sample milk from large herds. The tube is then labeled, capped, and carried to the "rolling lab."

There, sample tubes are recorded on a list that shows the dairyman's name, address, county, and number of cattle in herd.

Tests begin when a measured amount of antigen is put into each tube. After the chemical remains in the milk for one or two hours, depending upon the temperature, results show up clearly. A blue cream ring on top of the milk indicates herd infection; an intermediate variation means possible positive reaction that needs rechecking; a normal cream ring shows negative reaction.

No matter what the tests reveal, the dairyman, the county agent, and local Bang's supervising veterinarian receive a report of tests made of the dairyman's herd. If no reactors show up, the dairyman gets suggestions on how to keep his herd free of Bang's. Since the test is very sensitive, there is little or no chance that an infected herd will slip by, even when milk from 12 or more animals is tested in the same tube.

If a herd is believed to be infected with one or more diseased animals, the producer is advised to contact his local Bang's supervising veterinarian. If the dairyman places his herd under supervision of the veterinarian in either Plan 1 or the Certified Brucellosis-Free Herd Plan, the federal government will pay indemnity for culls not to exceed $25 for grade animals and $50 for purebreds. (A year ago indemnities were being paid in 40 states.) The owner of an infected herd also receives suggestions on how to prevent a recurrence of brucellosis.

What will the ring test be worth to dairymen in Alabama and producers in other states with the ring test? Mr. Parrish says this can be answered only by dairymen. They can completely rid their herds of the disease. It's a big job, but he points out that producers in Bang's-free states . . . Maine, New Hampshire, and North Carolina . . . *know* it can be done."

The ring test is under way in at least 32 states. Officials of

the USDA report that about one-fourth of U. S. herds tested thus far show the evidence of Bang's. These tests cost only one-fifteenth as much as blood tests of all animals in an area.

In summarizing, here are the words of Herman C. Aaberg, chairman of the National Brucellosis Committee of the Livestock Conservation, Inc.: "Opportunity for wiping out brucellosis has never been so good. We have everything necessary for a successful eradication campaign.

"Research gives us the knowledge of what the disease is and how is can be combatted. It gave us the blood agglutination test to detect individual reactors and the ring test to find infection in herds. It has given us Strain 19 vaccine for calfhood vaccination, and very recently provided a means of pinpointing reactors among vaccinated animals.

"Experience has taught us how to apply this knowledge in a coordinated drive against the disease. Three states are now modified certified Brucellosis-free. Others are driving toward this goal. Experience has given us a reservoir of technical people trained to do the job.

"Education has pointed up the need and created the desire to rid this country of this costly disease of livestock.

"Money to do the job was provided by Congress when it made available an additional $15 million a year for the two fiscal years ending June 30, 1956—all to be thrown into the fight against Brucellosis.

"So, we have the knowledge, the experience, the desire, and the money to do the job. If we fail now, it's nobody's fault but our own."

New Standard Grade In Beef Explained

If you've noticed a purple "standard" mark on beef you've bought recently, here's the reason for it. —

Some local retailers and wholesalers are putting into use the federal grading regulation that went into effect recently establishing a new "standard" grade in beef carcasses, marketing specialists explain. Some animals that were once graded "commercial" may become "standard" if they are the younger animals in this class.

As far as the kitchen cook is concerned, specialists have this advice: if you buy standard beef, use regular cooking methods. Quality of meat is good, it's tender when cooked properly, and it has little fat. Federal meat grades are prime, choice, good, standard, commercial, utility, canner and cutter. —*Oregon State College*

Now, Ship Cream in Plastic Bags!!

A new development offers great advantages over old methods of shipping cream . . .

Condensed from Missouri Ruralist

FOR MANY years dairy experts have insisted that one of the biggest problems in selling butter was quality. Many steps have been taken to improve quality of cream and butter.

Now, a new development offers considerable promise in this field. The Galva Creamery Co., of Galva, Ill., one of the nation's largest butter manufacturers, is supplying its customers with plastic bags for shipping cream. Several hundred farm families, along the Burlington Railroad in Northern Missouri, are shipping cream regularly by this method. A special freight rate for cartons of cream has been offered by this railroad and will be extended to other railroads.

The plan is so simple the first reaction usually is: why didn't someone think of this before?

The creamery supplies all equipment to its producers—stainless-steel holders for filling bags, bags, plastic-covered wire, and cardboard cartons.

The bags each hold 5 quarts. They are placed in the stainless-steel holders and cream can go from the separator directly into bags. It's easy to determine when a bag is full—there's a hole in the side of the holder and when cream reaches this level 5 quarts are contained.

Bags are easily handled, can be stored in the home refrigerator. No pans, no crocks or other bulky utensils are requested. Bags are easily stacked, require little space. This means cream is put under refrigeration as soon as it is separated, an important part of quality.

Cartons for shipping hold 4 bags, which, when filled, weigh less than 40 pounds including the carton and can be easily handled.

Both plastic bags and cartons serve as insulation, and tests last summer indicated cream arrives at the creamery at a much lower temperature than when in other type cans. Neither do bags freeze as quickly in cold weather.

And of course, for the producer, it's a one-way trip—nothing to pick up and haul home and nothing to clean.

Where creameries have their

Reprinted by permission from Missouri Ruralist, Kansas City, Missouri

own pick-up routes they are able to use smaller trucks, as cartons require less space. In fact, 2 cartons with 80 pounds of cream require the same space as a 5-gallon can with 40 pounds. The same amount of butterfat can be hauled with much smaller trucks.

Every successful man I have heard of has done the best he could with conditions as he found them, and not waited until next year for better.—Edgar W. Howe.

Processors like the new bags, because operations are speeded and simplified at the plant. Considerable labor is eliminated.

Certainly, this looks like a step forward in the butter industry.

Dairy Farm Economic Outlook Brightens

Next year should bring slightly improved returns to dairy farmers compared to 1956. Agricultural economists at the University of Minnesota say one reason for the expected improvement is that per capita consumption of dairy products in the nation has gone up slightly since 1950.

Each man, woman and child consumed, on the average, 349 pounds of fluid milk and cream, 47 pounds ice cream and 9 pounds of butter in 1954. Last year, the per capita consumption was up to 353 pounds of fluid milk and cream, 49 pounds ice cream and 9.2 pounds of butter.

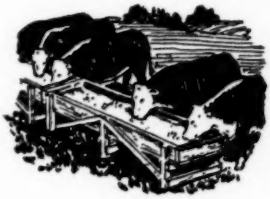
We're still producing more dairy products than we eat and drink up, though. While we consumed 700 pounds of milk per person in 1955, we produced 747 pounds of milk per capita. In 1956, we will produce an estimated 757 pounds per capita the economists say.

The government is buying less dairy products than a year ago. Purchases for 1955 totalled 162 million pounds of butter, 150 million pounds of cheese and 556 million pounds of non-fat dry milk. Estimated purchases for 1956 are 99 million pounds of butter, 68 million pounds of cheese and 342 million pounds of non-fat dry milk.

Price supports in effect until April, 1957 include: butter, 59.5 cents per pound for 92 score; cheese, 35 cents per pound for grade A; spray powder, 16 cents per pound and roller powder, 14.25 cents per pound. These prices are based on the Chicago market.

—Minnesota Extension

Salt Can Control Self-Feeding Intake



Research has proved that salt makes it possible to self-feed protein supplements on the range . . .

Condensed from Shorthorn World

Dr. D. A. Savage

PELLETS of cottonseed meal or other vegetable oils are used extensively as protein supplements for livestock on native range throughout the West and in many other sections of the country. They are principally used in late summer and throughout the winter months when the dormant range forage is deficient in protein. A common practice is to feed the pellet ration every day. The concentrate, as ordinarily prepared, cannot be self fed without detriment to the animals through excessive use.

Since daily hand feeding entails much expensive labor and other disadvantages, several Southwestern stockmen made the ingenious discovery that the oil meals could be self fed to livestock by mixing sufficient loose salt with the meal to govern daily consumption. A few cattlemen have been using this self feeding method for many years with apparent success. However, until recent years, the practice was not widely adopted by others because of the popular belief that the quantity of salt required to regulate daily use of meal would be detrimental to the animals.

Increasingly high costs for labor encouraged many stockmen to try this labor-saving method of feeding in recent years. Prompted by an increasing demand for precise information on this self-feeding practice considerable research has been conducted on the subject at Woodward, Okla., and elsewhere in the Southwest.

Range feeding trials, comparing self-fed, salt-fed, salt-meal mixtures with daily hand fed pellets made from the same meal, have been in progress at Woodward since the fall of 1948. The work was conducted with strictly comparable lots of whiteface cattle grazed on uniform native range pastures. The comparisons were further improved in accuracy by rotating the cattle lots

Reprinted by permission from Shorthorn World, Aurora, Illinois

between pastures to eliminate effects of any minor differences in vegetation. The tests were conducted with steers throughout the period and also with breeding cows during the past two years.

Cottonseed pellets or meal, containing 41 per cent crude protein, were used in all tests, with rolled milo grain added in one comparison. Adjustments were made in the proportion of salt to meal so that all cattle in any given comparison received the same amount of meal or its equivalent in pellets during the first four years. This was done to refine the accuracy of the feeding-method comparisons. After this four-year period the tests were conducted to determine consumption and performance with only enough mixtures to coincide with increasing salt-tolerance developed by the cattle.

The pellets were fed in open bunks; the salt-meal mixtures, in special bunks with roofed tops and walled backs and sides to eliminate wastage from wind or rain. Careful records were kept of the amount of salt, meal, and pellets consumed by every lot of cattle. Special 24-hour-long observations were also made at intervals to determine the grazing and feeding habits of the animals as affected by the different feeding methods.

Salt, when thoroughly mixed with cottonseed meal or meal-grain mixtures, has been used successfully by the station and many stockmen in maintaining daily consumption at desired levels on a self-fed basis. The feed-governing effect of salt is explained by the fact that the animals stopped eating the mixture when they had consumed all of the salt they could assimilate each day, when they had become satiated with salt.

The quantity of salt—satiation limit—and its proportion to meal were important in regulating daily use of the mixture. Requirements for this purpose varied with weight and age of animals, quantity and quality of range forage available, length of feeding period, and the amount of meal intended for daily consumption. Under these different conditions the actual amount of salt a given class of animals would consume each day determined the proportion to use with the meal.

About one half pound of No. 4 crushed rock salt was required to regulate daily winter consumption of a weaner calf weighing about 400 pounds. With this quantity of salt established as the average daily satiation limit for a calf, it becomes a simple matter to mix this amount of salt with whatever quantity of meal an operator desires his animals to consume in a day. For example, mixing one half pound of salt

with every two pounds of meal, a proportion of one to four, usually maintained daily meal consumption of a weaner calf at two pounds in these studies. Likewise, mixing one half pound of salt with every one pound of meal, a ratio of one to two, governed daily use of meal at one pound.

Larger animals required more salt to control their daily use of the mixture. Daily consumption of meal was held at two pounds per head in winter by mixing seven-eighths pound of salt with every two pounds of meal for 700-pound steers, and five-eighths pound for 500-pound steers. These results indicate that simultaneous self feeding of salt-meal mixture to radically different weight classes of cattle should be avoided if uniform meal consumption is desired for all animals. However, this may not be so important in self feeding grain mixtures since the requirements for larger animals are usually greater than for smaller ones. Nonetheless, it seems generally advisable to separate a herd into reasonably uniform groups to facilitate the feeding operations.

The quantities of salt listed above for different weight classes of steers usually had to be increased slightly during the winter as the animals developed greater tolerance for salt. Similar results were obtained with breeding cows. In order to maintain their daily use of meal at two pounds on a self-fed basis, it was necessary to start the feeding period by using seven-eighths pound of salt to every two pounds of meal and to increase the salt to about one pound as the feeding season progressed.

The amount of salt required to regulate daily consumption of self-fed, salt-meal mixtures was less in summer than in winter, the figures for yearling steers being seven-eighths of salt in winter and one-half pound in summer. Those results are explained by other investigations which showed that range beef cattle require more minerals in winter than in summer. This was determined by recording the amount of salt and mineral mixtures consumed by many other lots not fed any salt-meal mixtures. In these cases the cattle had free access to open bunks containing the minerals. Under these open range conditions the average monthly mineral consumption of breeding cows was about 1.8 pounds per head in summer and 2.3 in winter. Incidentally, this form of mineral consumption was significantly higher on heavily grazed pastures than on those grazed at moderate or light intensities.

Similar results were noted in the self-feeding comparisons. The better and more plentiful the range forage, the less salt was re-

quired for a given rate of meal consumption. Considerably more salt was needed to govern self consumption of meal on heavily grazed areas. In like manner, the salt requirements for regulating consumption was greater on pastures grazed continuously at moderate rates than on areas upon which grazing had been deferred during the previous growing season.

During the past five years the average winter gains of weaner steers self-fed the salt-meal mixtures have been 14 pounds less than the gains of comparable cattle hand-fed equivalent amount of protein in the form of pellets. In a similar summer feeding experiment with yearling steers the salt-meal mixtures caused no significant reduction in summer gains during the five-year period. It seems likely that the 14-pound average reduction in winter gain was due to the extra energy required by the salt-meal-fed cattle to consume about twice as much cold water in winter. Records showed that weaner calves self-fed the salt-meal mixture drank nine gallons of water per head daily compared with only 4.5 gallons for the pellet-fed lots.

This conclusion is confirmed by the results of special tests which showed that cattle having access to warmed water in winter gained 16 pounds per head more than comparable cattle on unheated water.

Salt-meal feeding on the range had no ill effect on subsequent gains of feed lot cattle. Cattle placed on full feed rations in the standard feed lot manner, after having been on a range supplement of salt and meal for 150 days during the preceding winter and for 80 days in late summer, showed no difference in feed lot gains when compared with similar cattle that had been pellet fed on the range.

In colonial America, nine out of 10 people had to work on the land to provide enough for themselves and the 10th person living in town. By 1860 with an agricultural revolution sparked by the reaper well underway, one farm worker could provide for himself and 3½ other persons. As a result industrial centers expanded rapidly. By 1940, a farm worker took care of himself and 10 others, including those in the armed forces, and industrial arsenals, could operate full blast. Today, one farm worker provides enough for himself and 18 others.

Salt feeding of salt-meal mixtures at considerable distance

from water has been advocated as a means of accomplishing desirable grazing distribution, reducing grazing pressure near water and making use of lightly used forage far from water. Tests conducted on a limited scale at Woodward showed that self feeding up to one-half mile from water was not detrimental to livestock. Both the summer and winter gains were the same from feeding away from water as they were from feeding close to water, and the salt required to regulate daily consumption of meal was less by feeding some distance from water.

Most of the feeding tests at Woodward were conducted with No. 4 crushed rock salt. It was deemed advisable, however, to conduct studies to determine if a finer though more expensive grade of salt would be more effective in controlling self consumption of feed mixtures. Results of comparative studies on this subject showed that the No. 4 grade was slightly superior to either K.D. granulated or "flake flour" salt in controlling meal consumption.

Phenothiazine is widely used to control internal parasites in sheep and is receiving increased attention for this purpose in beef cattle. In conducting studies of this kind at Woodward, a special test was made to determine if the addition of phenothiazine to salt-meal mixtures would not only control internal parasites but reduce the amount of salt required to govern daily consumption of concentrates. Positive results were obtained in both respects.

Self feeding of salt-meal or salt-grain mixtures to beef cattle on western rangelands has many advantages and few limitations. It is particularly advantageous in large, rough or heavily wooded areas where cattle cannot be gathered easily or where labor is scarce, high priced, or undependable. The saving in labor, the ease and convenience of feeding, and the elimination of daily animal disturbance from pellet feeding tend to overcome any slight reduction in winter gains which was the only ill effect noted in the Woodward feeding work.

The self feeding practice enables all cattle to consume their daily quota of concentrates without disturbance when ample bunk space is available. The mixture is also helpful in training calves to eat protein supplements for the first time. The method also reduces the tendency of vigorous animals to eat at the expense of weaker animals when fed pellets in the usual manner.

The salt-meal feeding method has fewer advantages over daily hand feeding when the cattle are fed in small pastures and conveniently located for daily attention.

Efficient Use of Fertilizer

Know how to get the most out of your fertilizer . . .

Condensed from New England Homestead

James E. Sheeman

EVERY BAG of fertilizer you buy represents an investment from which an adequate return in crop production is expected. A dollar investment in fertilizer must return more feed than you could buy outright for the same dollar, otherwise there would be no sense in using fertilizer. On most northeastern farm soils, it will pay to use fertilizers on forage crops. But the size of the return depends directly on how efficiently the fertilizer is used.

Over the years research has given us information on how forage plants utilize plant food. We know, for example, that limestone plays on important role in the availability of fertilizers and their efficient use by forage crops. Most such crops grow best at a pH of 6.5 or higher. At this level fertilizer, particularly phosphorus, is most readily available to the crop. The first rule, then, for getting the most out of fertilizer on forage crops is to lime the land to the recommended pH level. This rule applies to alfalfa land as well as clover, grass, trefoil and corn land. Remember also that limestone reacts rather slowly and should be applied well in advance of crop seeding. It often takes six months to a year to raise the soil pH to the desirable level, especially on very acid soils.

Next consider the ratio and grades to use. Most higher analysis grades are slightly lower in cost per pound of nutrient than the lower analysis goods. They also constitute a saving in reduced transportation and handling costs per pound of plant food because more pounds of nutrients are contained in each bag.

It's important to apply the elements that the crop requires in the proper amount. Higher applications are wasteful, lower will result in poor production with consequent weed encroachment and loss of desirable vegetation. Check the recommendations from your own landgrant university

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for your particular soil and climate.

Fertilize the legume in grass-legume stands. Land adequately fertilized for legumes will also support the companion grass if 50% or more legume growth is present. If much less than 50% legume growth exists some nitrogen is desirable in the fertilizer. Fertilizer trials have shown that legume-grass stands will efficiently utilize at least 120 lbs. of actual potash in a normal year. Whether you use an 0-1-1 or 0-1-2 ratio should depend mostly on the need for phosphorus in your soil.

To make one pound of honey, it is estimated that honey bees have to travel a distance equal to twice around the world. Incidentally, the principal role of the honey bee is the pollination of about 50 agricultural crops for the production of seed and fruit.

Research has shown that splitting the yearly application of fertilizer on pasture and hay land is more desirable than one complete application. This is especially true in relation to potash which will leach from the soil more readily than phosphorus and which will be consumed in luxury quantities by the crop if over abundant. Top dressing after the first cutting or grazing and again after the last of the season is a good rule to follow.

Along with pasture and hay crops, corn is also an important crop on most dairy farms. Yields of 18 to 25 tons of silage corn can be produced on good land fertilized and limed adequately. For best results, corn should be fertilized rather heavily with a portion of the fertilizer broadcast and several hundred pounds per acre applied in bands. The banded fertilizer enables the crop to get off to a rapid start while the broadcast portion encourages a strong extensive root system. Sidedressing with nitrogen after the crop is up may be advantageous, especially if heavy rains have depleted the initial supply. Again, check your state's recommendations for amount and grade to use.

To get the most out of fertilizers, considerable attention must be given varieties selected, time and method of planting, stand count in the case of corn or percentage of grass-legume stand, and time and number of harvests.

A soil test interpreted correctly is the best method of determining fertilizer needs. Plan to have your soil analyzed and recommendations made by trained specialists. This service is usually available through the state agricultural experiment station or the extension service.

Market News Broadcasting

A review of 35 years of service and its value to the farmer . . .

Condensed from Agricultural Marketing
Lance G. Hooks

THE MOST inquisitive man in every terminal market is the Agricultural Marketing Service news reporter. From the early morning hours, Monday through Friday, he's busy talking to salesmen, buyers, brokers, and all other operators who are marketing agricultural products.

And he's always asking questions. At the produce terminal market you will hear him ask: What's the price on those watermelons? Did the lettuce arrive in good shape? How many carlots are you unloading this morning? Are potatoes moving?

The Agricultural Marketing Service news reporter wants to know prices, volume, rate of movement, demand, trading, quality and condition of offerings, and related information.

When he gets his questions answered he takes time out to call the local radio station and report market conditions. And he gives the same information to local newspapers, trade groups, and press associations. In doing all this, he helps to keep our marketing system functioning efficiently.

This broadcasting of market news has been going on now for 35 years. May 19, 1921, marked the first day of regularly scheduled radio reports. This was aired by radio station KDKA, Pittsburgh, Pa. It covered vegetables and fruits, was prepared by the local USDA market news reporter, the late J. K. Boyd, and was voiced by a KDKA staff member.

Before development of voiced broadcasting, some market news was transmitted by wireless. Earlier the same year—in February 1921—the University of Minnesota experimented briefly with radio telephone broadcasting of market news. St. Louis University also conducted some early experiments along this line.

Paving the way for future voice broadcasts were the earlier broadcasts in code, over short wave. The first broadcast by short wave was presented on December 15, 1920, over Station WWX, operated by the U. S. Bureau of Standards. Compiled by the U. S. Department of Agriculture, these market reports

Reprinted from Agricultural Marketing, Washington, D. C.

were relayed by wireless from Washington, D. C., to Bellefonte, Pa., St. Louis, Mo., and Omaha, Nebr. Each of these cities served a territory within a radius of about 300 miles.

Some 2,500 radio "ham" operators, located in these territories, took down the reports, and helped transmit them by posting them in railroad stations, post offices, banks, and country stores. By June 1921, market reports in Morse code were being received in 31 states.

This development in shortwave broadcasting resulted from a chance thought of W. A. Wheeler, then in charge of market information in the USDA Bureau of Markets, now part of the Agricultural Marketing Service. The idea came to him as he watched his son, a "ham" operator, sending and receiving messages.

The popularity of the market news broadcasts grew rapidly during the first few years. By April 1922, of the 129 standard band stations 36 were broadcasting one or more reports every day. These reports of market activities were picked up by listeners in over two-thirds of the United States.

Year after year, market news broadcasting has continued to expand—in keeping with the large increase in the number of broadcasting stations. In 1950 we saw the first experiments in telecasting market news. Now many TV stations carry market news as a regular feature on farm programs.

USDA makes periodic surveys to determine the extent of market news dissemination through radio and TV. Our last survey, in the fall of 1954, showed that more than 1,300 radio stations and 82 TV stations were broadcasting market news. A new survey to determine the use of market news by current broadcasters is in progress. Results will be available in a few months.

The purpose of the USDA market news service since its beginning has been to collect and distribute regularly and promptly through all means of communication, accurate information on current market conditions and to aid in the effective distribution and fair pricing of farm products. The first report, covering the marketing of strawberries, was issued from Hammond, La., March 1915.

During its early years the USDA distributed the market information it collected largely by posting in the market places, by mimeographed reports, by mail, and by telephone at the expense of the recipient.

Beginning in 1917 a weekly summary, known as "The Weekly Review," was prepared in the Fruit and Vegetable Division and sent to agricultural and trade papers. During the 1920's many

steps were taken to broaden the weekly reports through daily and weekly newspapers. Our last survey, conducted in the spring of 1951, showed that market news was being carried by 1,046 newspapers with a daily circulation of nearly 37 million. The daily circulation of all newspapers then was approximately 53 million.

The value of market information, particularly that received over the radio, is well illustrated at some livestock markets, where what is known as a radio session is held in the afternoon. In these instances, producers listen to market broadcasts and, if market conditions are favorable, livestock is immediately loaded and taken to the market that day. These broadcasts provide hour-to-hour information on the markets.

In a 1948 survey of 178,000 Iowa farmers who marketed any of that State's 6 major products, 92 per cent listened to market reports from day to day before their most recent sale of at least one of those products.

A number of stations supply remote control facilities that enable Agricultural Marketing Service market reporters to broadcast direct from a market. Some stations provide 3 to 5 market broadcasts a day so that the territory they serve may be kept fully and promptly informed about price trends and other important changes in market conditions. Market news is now available over most radio stations serving rural areas.

Radio stations now obtain market news from 119 year-around and 33 seasonal Agricultural Marketing Service offices. Coverage has been expanded and market reports now carried by radio stations include market information on all principal types of farm products, such as fruits and vegetables, dairy and poultry, livestock, cotton, grain, and tobacco.

Market news broadcasting has grown to be a strong link in the marketing network that channels farm products from the farmer to the ultimate consumer. It has come to this because it has proved itself of practical value in furthering the efficiency of our marketing system during its 35 years of service.

Living Evidence

In one of the Lincoln-Douglas debates, it is said, Douglas accused Lincoln of being two-faced. Without hesitation or change of expression Lincoln calmly replied, "I leave it to my audience. If I had two faces, would I be w e a r i n g this one?" — Raymond Forkel in Ford Farming.

He Learns as He Teaches

This Ohio Farmer has been host to five foreign trainees . . .

Reprinted from The Nation's Agriculture

Ben Sunbury, Managing Editor,
Ohio Farm Bureau News

WHAT have you done lately to enhance the prospects of world peace?

Mr. and Mrs. Ed Converse, of Plain City, Ohio, don't figure they've contributed much. Yet, the Converses have had five foreign farm boys on their dairy farm within the past four years. Actually, there have been more than five, but the Converses don't count the foreign boys who came on a "week basis"—only the ones who were here long enough to "become a member of the family."

From Ben Prieto Reyes, of Mexico, Ed Converse heard the fifth foreign language in four years. He's brushed up against Italian, German, French, Danish, and Spanish, and appears the better for it.

"I haven't picked up much in foreign languages," Converse admits, "yet I have learned much from the boys. Above all else, I've learned that people the world over are quite alike, yet all different — that differences are not because of color of skin or languages, but of backgrounds and customs. Most of all, people are different because they are Livio Rugolotto, or Gerhard Siebert, or Ed Converse, not because they are Italian, German or American."

You realize that Converse believes in what he says when he describes his f o r e i g n "farm hands." Almost never is nationality mentioned unless you bring it up.

"First, there was Livio (Livio Rugolotto, of Italy) who spoke with his hands. He'd never been around farm machinery before, but helped me plant corn the first afternoon he was with me. The next day, he helped plow soybeans. There was nothing Livio wasn't willing to try and very few things he could not

Reprinted by permission from The Nation's Agriculture, Chicago, Illinois

master in short order.

"Then, there was Arne (Arne Piehl, Denmark) who first would size up a job carefully and then proceed to do it the most efficient and economical way possible. Probably, I learned the most from Arne.

"Pierre (Pierre Vincent, of France) had to know exactly what he was supposed to do and how to do it. I'm afraid there wasn't always time and I regret that of all the boys, Pierre was the only one who didn't feel at home. Maybe, if we'd had more time . . .

"Gerhard (Gerhard Seibert, Germany) was a 'walking encyclopedia'. He went by the book. If the book was right, Gerhard did fine; if not, he had to learn the hard way.

"As for Ben (Ben Reyes, Mexico), he's a good boy and a willing worker. He's been out to show the whole community, including myself, that we shouldn't judge all Mexicans by story books. Ben represented his country well in every respect."

From personal experience Mrs. Converse can underscore the importance of judging people on an individual basis.

"It was not until Livio came with us that he learned to like spaghetti", Mrs. Converse laughs. "Livio couldn't get over how we thought that all Italians eat spaghetti.

"But I was really embarrassed when Ben came with us this year. Just so he'd feel at home, I cooked some chili. Do you know that it was the first chili he'd ever eaten. And he doesn't care too much for it either."

Mrs. Converse agreed that it was funny how you build up impressions of other nations.

"I know it's been good for most of the boys to see American farmers working right out in the dirt. Somehow, with all our machinery, many had felt Americans farmed in a push-button fashion.

In their bathing suits, many girls remind you of a bad photo. They're under-developed and over-exposed.

"All of the foreign boys came here with the idea that we are wasteful. But they have learned, very often, that time is more important to an American farmer than making sure he gets that last grain of wheat, or an ear of corn falling off the wagon on the way to the granary.

"Many have been glad to learn that Baptists speak to Methodists and that Protestant farmers exchange work with Catholic farmers.

"Yes, it's been good for them, and good for us."

Problems with Bulls in Artificial Insemination

Because of their great value, special care must be given to bulls maintained in Artificial Insemination Studs. These same factors of good management also apply to all other bulls maintained on farms . . .

Condensed from Holstein-Friesian World

Dr. John B. Herrick, D.V.M. Ext. Veterinarian, Iowa State College

EVERY STUD manager, or owner of a bull, is conscious of the problems of selecting bulls of good health and fertility and of keeping them that way. The greatest disappointment a stud manager experiences is to find, after acquiring a bull of great worth, that he is not serviceable. Many of the problems that concern the health and fertility of a bull can be prevented by a thorough health check before he is admitted to a stud.

The following discussion is the result of observations of bulls in studs and also of bulls on farms where they are used for natural service. Stud managers are aware of these problems, yet the users of artificial insemination in general are not.

Moving the Bull

It is definitely known that moving a bull, and changing his normal habitat, will affect his level of fertility. There is great variation between bulls in this connection, yet the problem is often unheeded. Careless handling of the bull, restraint and rough, reckless, transportation may upset the fertility level for several weeks to months. Neurogenic sterility is frequently encountered both in the male and the female, particularly the male. It is not uncommon to see a bull of high fertility, drop r a p i d l y when moved to a new location. Sensible people should handle bulls; people who are as smart as the bull. The careless handyman is not the man who should load and haul the bull.

It is a recommended procedure to provide a scrotal support when moving bulls. The pendulous nature of the external organs often results in peritesticular hemorrhage or causes a partial or sometimes complete hernia. Attempts to similate the accustomed feed, housing and handling of the bull at a new location is also recommended. Studs should

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equip themselves with quarantine areas consisting of a shed and paddock that the bull may be confined to for at least 40 to 50 days after arrival at his new home. All blood work, feet trimming, and other handling must be delayed for at least a few days after arrival and yet should be done as great a length a time as possible before the bull is put into service.

The bull's fertility should not be judged by the first or second semen collection, nor should it be judged by a collection made shortly after his arrival at the stud.

Nutrition and Its Effect on Fertility

The effect of nutrition on bovine fertility is not clearly understood. The ruminant has the ability to synthesize factors from feed consumed that other animals do not possess. Various establishments have incorporated highly fortified vitamin supplements, mineral supplements, and increased protein in the ration of bulls without any appreciable change in conception rate.

A protein intake of a liberal maintenance allowance (15-16% total ration) appears to be sufficient for good fertility. Good roughage with a sufficient amount of grain for good maintenance is desirable. Vitamin supplements are a necessity if the roughage is poor in quality. No thumb rule can be used as to the amount of grain a bull should receive. Again "the master's eye fattens the animal", in other words, a good bull man is an invaluable asset. Each bull will require different attention. Ample water and a complex mineral are necessities. Phosphorus intake exceeding that of calcium should be avoided because of the evidence in a few individuals that such a proportion will lead to a deterioration of semen quality. On the other hand a high calcium consumption may lead to an iodine deficiency.

Probably one aspect of management and nutrition that needs further investigation is the effect of temperature on the thyroid. Thyroid stimulating drugs are considered to be of therapeutic importance in treating loss of libido, or a drop in spermatogenesis.

Nutrition of the sire is a complex problem and no doubt varies considerably with the age of bull, volume of sperm produced, frequency of use, environmental conditions, atmospheric temperature, and condition of the bull.

Exercise and Temperature

It would appear that for all breeding animals that ample exercise is a necessity. Yet bulls have been observed in paddocks or stalls for years with a high degree of fertility. In some studs

the "merry-go-round exerciser" has been idle for months while in others, individual paddocks and low cost shelters are the desired type of housing. Again it varies tremendously with the individual animal. Aged animals may require very little exercise, while certain individuals thrive on very little shelter and ample exercise. Short stalls, and crowded conditions are thought to lead to an increase in crampiness, a prevalent condition in many bulls.

Cattle in 1965

Some agricultural economists have predicted that the number of cattle on the farms and ranches of this country in 1965 will amount to approximately 106,500,000 head as compared with 97,500,000 head on January 1st of 1956. The estimates were made on the basis of previous cattle cycles, the ratio of cattle numbers to human population, and economic factors such as per capita income.

Extreme temperature variations have been shown to have a decided effect on a bull's fertility. When the temperature reaches 80 degrees F. a bull suffers from the heat and his thyroid activity decreases. Therefore, an effort should be made to keep bulls cool during the hot summer months.

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Foot Care

The bull is no more valuable than his feet. Foot care is extremely important. Ample exercise is a good foot conditioner but frequent foot care is a necessity. One of the best investments in a stud is an operating table where the bull can be gently restrained and in a recumbent position be given the best of "foot manicures". Corns between the toes of a bull should be removed surgically as soon as they appear to be troublesome. A good bull man will have bulls with good feet. Foot rot in these cases is a rarity.

Hardware (Traumatic Gastritis)

The bulls in a stud are valuable—so valuable that great pains should be taken to prevent wires and nails from getting into the feed. Magnets on feed grinders, coupled with prevention, will prevent a good deal of "hardware trouble." Surgery in the early phases of traumatic gastritis has saved many bulls from the packing house.

Sudden Drops in Fertility

A drop in the conception rate of a high fertility bull may be due to several factors; sore feet, digestive upsets, change in feeds, orchitis, adhesions of the penis to the prepuce, gonitis, tumors of the glands and infections in the genital tract.

Another condition called testicular hypoplasia, a condition in

which the generative cells in the testicle fail to function may be due to injury and inflammation. It has also been found to be an inherited condition. In the United States this genetic aspect has received little attention. In Sweden it has been found to be due to a recessive autosomal gene and the condition may be bilateral or unilateral. A male animal with a good endocrine constitution showing ample libido and high spermatogenic rate will maintain satisfactory conception rates even under unfavorable management practices. On the other hand, bulls with a weak endocrine mechanism lose fertility in a short time under an unfavorable environment. Perhaps through the years cattle breeders have perpetuated this condition in our cattle. In some cases biopsies of the testicle in low fertility bulls have shown hypoplasia. On the other hand, through the use of hormones many of these bulls have been brought back to satisfactory fertility levels. Hormone therapy therefore may cause perpetuation of this factor by temporarily increasing libido and spermatogenesis of the bull with low fertility. Stud managers thus have to take a long view of this particular problem.

Helpful Hints for Bull Care

1. Periodically check the teeth of the bulls, particularly aged bulls. Poor teeth will result in a bull in poor condition.

2. Crampiness may be the result of improper housing. Cortisone products will give satisfactory results in some bulls in overcoming this condition. .

3. Preputial hairs clipped too short will often result in ingrown hairs causing pain and the bull will refuse to jump.

4. Worm infestation has been found to be a problem in young bulls.

5. Pulmonary adenomatosis may be the cause of the disturbance that looks like pneumonia but will not respond to treatment.

6. Bulls in great pain after a truck ride or following a collection may have a strangulated hernia. They need immediate attention.

7. Infections in the genital tract are common. A physical and bacteriological examination should be conducted on the bull, and the ejaculate, where bulls show sudden drops in fertility.

8. Bulls need to be handled with care. Abuse and rough handling is not conducive to a high fertility level. Bulls become accustomed to one good caretaker. Keep him!

9. Lice and mange are unexcusable.

10. Don't treat, bleed, or trim feet in the collection room!

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